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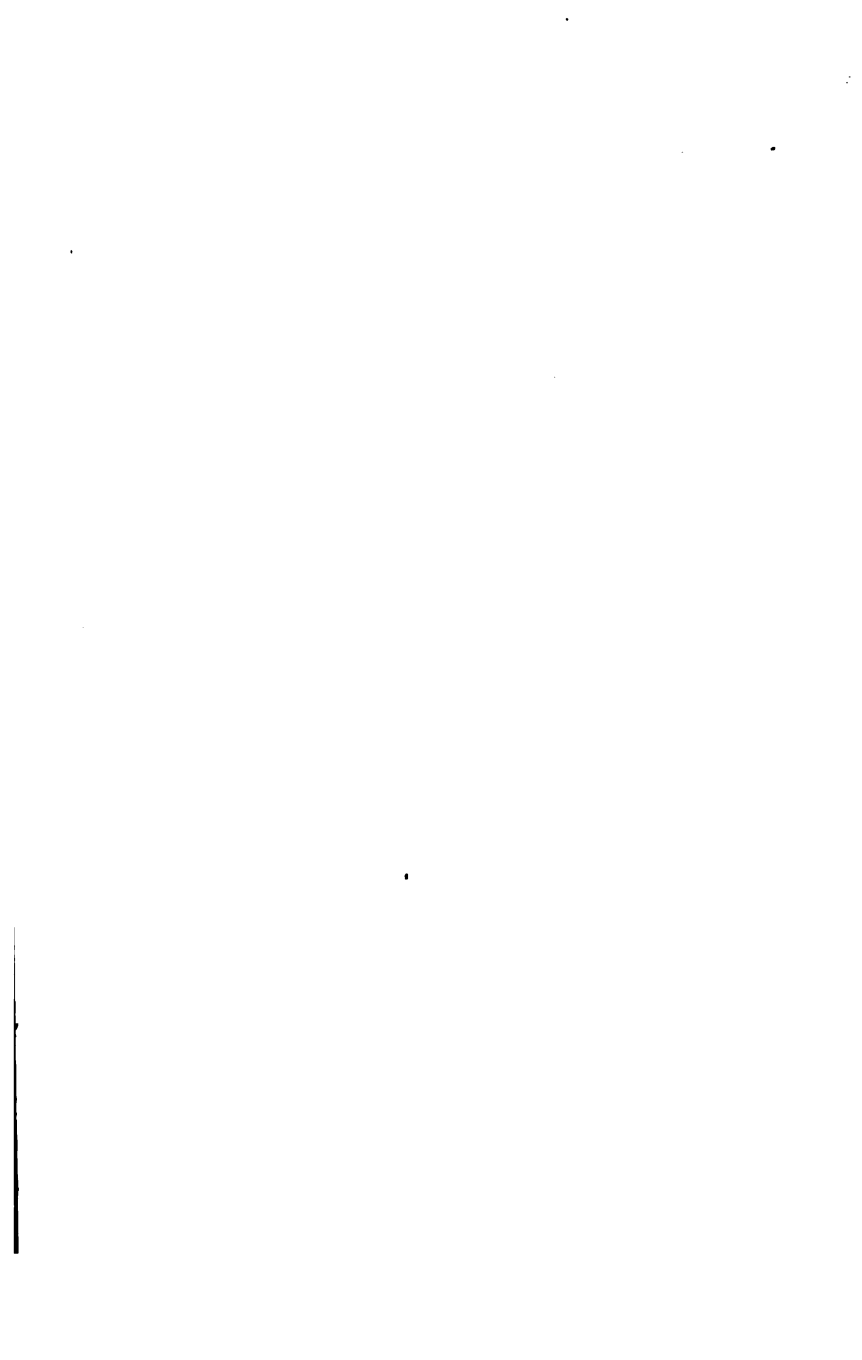
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The Story of the Cigarette

By
WILLIAM W. YOUNG



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PREFACE

Although there is no end to the making of many books, there has never been, until now, a beginning to the making of one authoritative book about the cigarette. Legions of industrial volumes have been written and published, and more and more are being written and published every year. From the digging of ore below the earth to the flying of airships above it, there is scarcely any business or trade that has not inspired its scores of codexes, manuals and tomes, each treating its especial subject from one of a score of angles.

Books about tobacco in general are, moreover, sufficiently numerous and weighty; so are books about cigars and books about pipes. But, on the specific subject of the cigarette, no serious and informative work has been compiled. Even magazine articles and pamphlets have been few, and nearly all of these are biased—the controversial utterances of the agents or zealots of a propaganda.

This is the more strange when one considers the scope of the cigarette industry and the arguments that it has aroused. There is no state in the Union in which the cigarette has not been the object of legislation; there is no village so small but the cigarette has entered the lists of its local controversies.

For nearly half a century the manufacture of cigarettes has been one of the leading industries of the United States. By leaps of millions,

PREFACE

even billions, it has grown until, now, our country produces more than 16,000,000,000 cigarettes every year. To make these there is employed labor, skilled and unskilled, to an extent that not many other businesses equal. Thus the cigarette provides a living for a vast number of our people and is consumed by the majority of our male citizens. Yet it will be in vain that you search publishers' catalogues and libraries for any reference book about it.

To supply this need the present work was undertaken, and because of the need the task was not small. I am grateful for every assistance rendered. I acknowledge the courtesy of the American Tobacco Company for permitting me to go freely through its warehouses and factories, and I thank its experts on domestic and Turkish tobaccos for the data they supplied.

It has been my endeavor to secure and present the facts concerning the history and the remarkable development of this industry. It has been my aim to tell how, from the ground where the tobacco is grown to the counter over which the cigarette is sold, this article of commerce and comfort comes into being and reaches the consumer. And, finally, it has been my intention to find the truth, to correct misstatements and to place before the public the unbiased verity—good, bad or indifferent—about the question in hand.

W. W. Y.

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The Story of the Cigarette

CHAPTER I

THE PART NATURE PLAYS

First Account of the Cigarette—When Tobacco Was Legal
Tender—Beginning of Cigarette's Popularity—First
Cigarette Machines—Test of Cigar and Cigarette—
Influence of Soil and Climate—Preparing
Soil and Transplanting—Plant Pests
and Cultivation.

THE word "cigarette" is, of course, of French origin. It is the diminutive of "cigar," which, in turn, is derived from the Spanish *cigarro*, itself a diminutive, meaning a little garden. When tobacco was first introduced into Spain it was considered—and, indeed, as far as Europe went, it really was—a very rare and valuable plant, and the Spanish dons cultivated it in the gardens of their homes. In those days, the grandee took great pride in offering his guests tobacco wrapped in the form of cigars, and in telling the recipients that these gifts were made from plants raised on his own land.

"*Es de mi cigarral*," he would say: "It is from my garden."

Foreign visitors to Spain heard this phrase frequently and, returning to their homes, repeated it in various parts of the world. There, persons unacquainted with Spanish are supposed to have taken up the words and shortened them to the mere three syllables of "cigaro," which in time came to be the gen-

eric term for all tobacco rolled up for smoking. In England, word evolution at last changed "cigaro" to "cigar," and out of that we get our diminutive "cigarette" from across the English Channel.

The make-up of the cigarette should be equally familiar, but it never is. Of the paper, the tipping, the printing, the packing, I shall have to speak later, as well as of the properties of the entire product. What must be first considered is the tobacco itself—the tobacco, which belongs to the nightshade (*Solana-ceæ*) family, to which also belong so many of our best known domesticated food plants, including the tomato, the eggplant and the potato. The first thing that strikes the investigator of the cigarette industry is the ignorance of the general public upon the subject of the cigarette.

Most men smoke cigarettes, yet few know what they are smoking. My own case, as subsequent experience has proved, is a case in point.

Some years ago, after having smoked pipes, cigars, and to some extent cigarettes, for twenty years, I happened to be motoring in beautiful Dane County, Wisconsin, one of the richest farming districts of the United States. Land excellently cared for and wonderfully productive stretched away on either side of the road, sweeping, in every shade of green and brown and yellow, up and over the low hills, and of this land acre after acre was devoted to what then appeared to me to be a particularly good species of tobacco. I

brought the car up to a fence behind which a farmer was working.

"That looks like good tobacco," I said.

He nodded. "The best in the North," said he.

"Does it pay you well?"

"Better than anything else."

"What's it used for?"

"Smoking."

"Yes, but what kind of smoking? Cigars, I suppose?"

The farmer nodded again, this time more emphatically.

"Yes," he said: "cigars. It ain't quite the sort that's good enough for cigarettes."

At that time I was amazed. Since then a knowledge of tobacco has enlightened me. The farmer was right. Cigarette manufacture is a business, not a philanthropy. It is conducted as are all other businesses, not for charity, but for legitimate profit; and the cigarette maker has learned that, if he wants to retain his customers, he must supply them with nothing but the best material. The poor qualities will betray him; the commonplace will not last. Whether he wants to or not, he has to provide better tobacco than is necessary in the cigar trade, and nothing but the brightest, sweetest and most expensive tobacco is used in the cigarettes manufactured in America.

Thoroughly to understand why this is so, it is necessary to speak at some length of the make-up of other forms of smoking tobacco. Properly to appreciate how the requisite ma-

terial is procured, it is necessary to know the part that nature plays in the industry.

Of all things American nothing is more so than the cigarette. It was from the New

**First
Account
of the
Cigarette**

World that tobacco came to the attention of the civilized nations, the first account of it being that which includes its portage to Europe by the men that sailed with Columbus on his voyage of discovery.. Nor is this all. When, for the first time, a European set foot in the Western Hemisphere, those Indian natives of San Salvador who so startled the brave Genoese by blowing smoke from their mouths and nostrils were really smoking crude and primitive cigarettes—tobacco wrapped in the leaves of Indian corn.* Bartholomio de Las Casas the apostle of the Indies (1474-1566), who edited the journal of Columbus, himself, in his "Historia de las Indias," tells of two men of Columbus's party who, on Tuesday, November 6th, 1492, returned from an expedition inland with an account of how the aborigines were accustomed to the solace of tobacco. Their manner of smoking, as narrated by Las Casas, plainly suggests the cigarette, and this is accounted the earliest reference to the use of tobacco in that form. The natives of the New World, said the Spaniard, "wrap the

*Opinions differ as to the nature of the leaf that was used by these aborigines for the purpose for which cigarette paper is now employed. Some authorities say that it was the leaf of the palm, but the general opinion of historians is that it was the leaf of maize.

tobacco in a certain leaf, in the manner of a musket formed of paper," and "having lighted one end of it, by the other they suck, absorb or receive that smoke inside with their breath."

There is, of course, no way of learning for how many centuries the Red Man had been using tobacco. It is enough for our present purpose to know that tobacco smoking is ancient and American, and it is almost equally interesting to reflect that corn and tobacco, the two greatest gifts of the American Indian to mankind—corn to feed and tobacco to comfort—have grown in volume and value until, today, they are a pair of the greatest natural products of the United States. Certainly the former, already a staple article of food among our own people, will invade Europe in force at the end of the present war, and certainly the latter has for years been used among a greater number of nations than any other cultivated product of the soil, and by more people than any other product, with the possible exception of tea and coffee.

Aside from such crops as were necessary to the maintenance of the individual pioneer's life, tobacco furnished practically the first agricultural pursuit to those colonists who came here from England and became the original farmers of the New World. Many a year passed before there was any other of a magnitude worthy of the economist's attention.

England was the first country of Europe to take up smoking, and the practice grew with such rapidity that there was, very soon, a con-

stant and great demand for tobacco. Consequently, it was the English settlers at and about Jamestown, Virginia, that developed tobacco growing from the wild state into the beginning of scientific cultivation. Then, when it was found that, by care, the leaf could be improved in quality, the demand for the better grades increased, and there was such a tobacco boom that even the streets of that little outpost of civilization were turned into tobacco fields.

For the next two centuries, tobacco culture was closely identified with the economic, social and political growth of the colonists, especially in Virginia and Maryland. In Maryland tobacco was made legal tender in 1732, at the rate of a penny a pound. It was the legal payment for all debts, including customs, taxes and the salaries of State officials and ministers of the gospel. The tax levied for Baltimore County and city as late as 1777 was fixed at 172 pounds of tobacco per poll.

The crop of the country the year previous was 2,440,947 pounds, of which Maryland supplied the greater part. Fluctuating greatly in yield and price from decade to decade, the crop in 1914 reached the stupendous total of 1,034,679,000 pounds, valued at \$101,411,000 for the leaf as marketed by the planters. The record crop was 1,055,765,000 pounds in 1909.

In scanning the Government reports, it is at once noticeable that as soon as the cigarette became popular, the advance of tobacco

became phenomenal. The periods of greatest growth, in both volume of crops and prices paid to planters, has always been coincidental with the gigantic development of the cigarette business in this country, and largely caused by it. It is therefore clear that the cigarette has played a very important part in furnishing the wealth of the nation as regards the prosperity of the farmer, besides yielding an enormous revenue to the Government in the shape of internal-revenue taxes.

The cigarette as we now know it—that is to say, tobacco enclosed in a paper tube—is doubtless of Spanish origin, but its form, like its name, was perfected in France. There, cigarettes became a government monopoly in 1843, although it was

*Beginning
of the
Cigarette's
Popularity*

not until a few years after the Crimean War, or about 1860, that the manufacture of cigarettes reached any importance commercially. It was, in fact, the Crimean War that brought world-wide attention to the cigarette as a superior form of using tobacco. Through intercourse with French, Italian, and especially with Turkish officers and troops in the war waged against Russia in the Crimea from 1854 to 1856, English officers began following the example of their allies and learned to make cigarettes. The soldiers made their own cigarettes, the Turks being particularly skillful in this art.

Coming back to London after the war, the dapper British officers, the idols of the day, continued to make and smoke cigarettes, and

naturally nearly every smoker in England, considering it the smart thing to do, began, clumsily at first, to follow their example. Cigarettes became the fashion. Americans soon brought the new style in smoking home from London, and about 1866 manufacturers in both England and the United States began to cater to the trade of cigarette smokers. Several brands entered regularly into commerce. At first they were large and expensive, and all were made by hand from Turkish leaf.

It was at just about this time that a new type of tobacco had been perfected and was gaining popularity in the United States. This tobacco was something entirely new and it was destined to revolutionize the cigarette business and to bring about cigarette production on a stupendous scale—cigarettes of high grade at a low price. We refer to what has become known the world over as “bright” Virginia tobacco.

The first crop of this bright yellow tobacco was raised in 1852 on one of the sandy ridges of Caswell County, North Carolina. Its cultivation soon spread in that county and also in Pittsylvania County, Virginia. It was of such fine flavor and texture that it made a superior plug tobacco filler and wrapper and an unusually mild and satisfying smoke. Up to 1869 it was limited to a small area and to local consumption, but it was at that time that cigarette making had become a fairly well established industry and manufacturers had found out that this bright yellow to-

bacco made a very superior quality of cigarette. This created a big demand and the cultivation of that type of tobacco extended into other counties of North Carolina and Virginia and into South Carolina and a small portion of Eastern Tennessee, which have in abundance the only sort of soil upon which the "bright" tobacco can successfully be grown.

Then came the invention of cigarette making machinery, first practical in the early seventies. This, coupled with the development of the "bright" Virginia tobacco, was the foundation for the great diversity of varieties and brands of cigarettes

*The First
Cigarette
Making
Machines*

today. As a consequence, American cigarettes have become known and are used all over the world. Even in far off Corea, according to a consular report, they are the best and most popular of all, and bid fair to supplant the famous Korean pipe.

So the trade has increased until in 1914 (the latest year for which figures are available), the cigarette industry reached high water mark in its phenomenal growth, and we are smoking 45,005,715 cigarettes a day and manufacturing 16,427,086,000 in a year.

The reason for this growth of the cigarette industry dates back, when one considers fundamentals, to those Jamestown colonists, of whom I spoke a few moments since. They had, as a matter of fact, builded better than they knew. Unaware of it though they were, not chance alone had made Virginia the birth-place of cultivated tobacco, nor is it chance

only that has turned that state and the regions immediately about it into the permanent home of the best grades of tobacco. In the last analysis, the determining factor has been the soil.

For the best production of the best tobacco a peculiar sort of soil is required, and that sort of soil—so far as American tobacco is concerned—the Virginia pioneers had stumbled upon. Since their time, the locating of such soils for such purposes has become a science; it has engaged some of the best energy of the United States Agricultural Department and the experimental stations of various states, all of which have confirmed the good fortune of the Jamestown settlers. To this day, because of the special adaptability of their soils to the growing of the finer grades of tobacco, the southern portion of Virginia, a large part of North Carolina, a portion of South Carolina and a little of eastern Tennessee produce practically all of the tobacco that goes into our domestic cigarettes. A similar set of circumstances determines a similar condition in the tobacco growing districts of Turkey and the Near East.

While there are several reasons why only the best grades of tobacco may profitably be used in cigarettes, the foremost reason is that, unlike the cigar smoker's judgment, the judgment of the cigarette smoker is formed solely by the sense of taste, and, after years of experimentation, it has been demonstrated that no added ingredient will improve the aroma

Virginia 25th Nov 1759

Sir,

Sometimes this week I expect to get on board
the Carr for your House, Fifty Hogsheds of my own
and Dr. Parke Custis's, which please to receive in the
usual manner. I shall also by the same Ship send
you ten or twelve more if I can get them on board
in time, but this I believe will be impracticable
if Capt. Salomon needs that dispatch in loading
which he now has in his power to do.

Yours Truly
George Washington

My Dear Mr. Wills
I am in London now and I thank
you for your desire in sending them

Wm. Wills
London

Adj. Gen. G. W. Wills

WHEN GENERAL GEORGE WASHINGTON WAS A TOBACCO PLANTER AND EXPORTER

Facsimile of a letter written by Washington in 1759 to the predecessors of the W. E. & H. O. Wills branch of the Imperial Tobacco Company, of Bristol, England. In this letter he notified them of a shipment of fifty hogsheds of tobacco of his own and John Parke Custis's, and ten or twelve hogsheds more if he could get them on board the ship in time. Washington was one of the substantial tobacco planters and exporters of his time, when tobacco not only ranked first among our exports, but was already the great staple of the South and was made legal tender at a fixed price per pound in some of the Colonies for the payment of all debts, including customs dues, taxes and salaries of State officers and ministers of the gospel.

77 2185
04870000

and smoking quality of pure tobacco leaf of the finer sort.

Although smoking in general has reached, among us, a stage where flagrant inferiority is not tolerated in a cigar or in pipe tobacco, it is nevertheless a fact that mediocrity is more likely to be overlooked in a cigar than in a cigarette; for a cigar smoker depends very largely on the appearance of the outside wrapper of the cigar he is about to buy, and this enables a clever manufacturer to roll inferior tobacco into the "filler"—the name given to the inner part of a cigar—so that, by the attractiveness of a wrapper, a prospective purchaser is often predisposed in favor of a really inferior cigar.

*Test of a
Cigar
and a
Cigarette*

Not so your cigarette smoker. Knowing that he forms his judgment of quality solely by taste, cigarette manufacturers long ago learned the wisdom of making cigarettes from nothing but pure tobacco. In fact, there is nowadays really no such thing as mediocrity in American made cigarettes; all are made from pure tobacco in the purest paper wrappers. The difference in quality of various brands is simply a question of the kinds of tobacco used; it is merely a matter of the individual taste of the smoker as to what kind of tobacco he prefers.

To repeat, then, the cigarette is the highest type of tobacco product and, compared with the ordinary cigar and other forms in which tobacco is used, it is of a distinctly finer quality. This is illustrated in several ways, but

nowhere in the long process of making a modern cigarette is this superiority shown more strikingly than in the parts played in its development by nature and the tobacco grower.

A mixture of loose sand and clay makes the perfect tobacco soil for the growth of what is termed "bright" tobacco, the finest of all domestic grades. This is the cigarette type, the leaves of which are of the same variety that is so familiar as the beautiful yellow wrappers of the higher grades of plug tobacco in which, as every tobacco user knows, appearance and the natural taste mean everything, and the soil necessary for its production is found in large areas of Virginia and her sister states. The typical "bright" tobacco land is very porous sand containing not over eight or ten per cent. of clay.

For the production of tobacco of a quality sufficiently fine to be used in cigarettes, this sand must be at least twelve inches deep upon the sub-soil. Very fine tobacco is produced on many areas where the sand is from five to ten feet deep. As a general rule the less clay there is in the soil and the deeper the sand, the finer the quality of the tobacco, provided weather conditions are such that it keeps growing continuously; but such very light soils produce a very small yield per acre, and there is danger of drought checking the growth of the plant, causing the leaves to thicken. So it has come to be recognized that the land which will yield the finest, most delicate cigarette tobacco is this sandy soil un-

derlaid at a depth of from eighteen to twenty-two inches with heavier clay. This substrata of clay helps to retain the moisture supply, renders the plant less subject to drought, and permits it to grow continuously to maturity. Too much rain is as damaging to the growing crop as is a drought; but the particular section of the South of which we are now speaking is blessed with a comparatively even season.

It is true of tobacco in a greater degree than of any other staple agricultural crop that the physical properties of the soil influence the physiology of the plant to such an extent as to determine the distribution of the many distinct types. Tobacco of one sort or another may be grown in nearly every part of the United States; but, while it can be so widely grown, the flavor and quality of the leaf are greatly influenced both by climate and soil, and it is surprising to find so little difference in the meteorological records for the various parts of the country where tobacco is grown and to reconcile this fact with the totally different varieties produced. By no means is there sufficient variation to explain the distribution of the different classes of tobacco, and yet this distribution must be due to climatic changes.*

*Influence of
Soil and
Climate on
Tobacco*

Tobacco is in fact one of the most sensitive of plants; it is far more sensitive to meteorological

*See United States Department of Agriculture Farmers' Bulletin, No. 83.

logical conditions than are the most delicate scientific instruments. Even in the extreme Southern regions where our finest qualities are grown, tobacco of excellent texture, such as goes into cigarettes, cannot be raised in the immediate vicinity of the ocean, nor even in certain areas of what otherwise would be considered good tobacco land; but the influences of nature that bring this about are too subtle to be detected by any of our meteorological instruments.

Again, so great is the influence of soil upon the quality of tobacco that a narrow strip of perfect, "bright" tobacco land may be separated by only a few feet from the heavier clay soil on which will grow only the coarser and commoner types of leaf. Often on one side of a fence will grow the superior cigarette tobacco, while on the other side will grow only the coarser, ranker leaf not suitable for cigarettes. Indeed we might go further and say that often even on the same stalk with the fine cigarette tobacco will be found leaves too coarse in texture to be suited to cigarette manufacture.

Nor does the peculiar sensitiveness of the tobacco plant end there. It reacts noticeably to the influence of the soil upon which it grows, producing a leaf that preserves a color traceable to the coloring matter in the soil.

Everywhere tobacco is grown there seems to be a decided reciprocal relation between the color of the soil and the color of the tobacco leaf when it is cured. There never has been a case reported in which a tobacco having the orange or lemon color characteristic of ciga-

rette tobacco, has been grown except on light-colored, porous soils; and a remarkable fact about this yellow tobacco (which was developed to a large extent almost coincidentally with the development of the modern cigarette) is that it has made what were the abandoned soils in North Carolina and Virginia the most valuable for agricultural purposes. Wherever this tobacco is raised the soils are practically the same in color, composition, porosity and general physical characteristics and constituent elements.

The sensitiveness of the tobacco plant affects the problem of fertilization. As a general rule, it may be said that cigarette tobacco is one of the purest products of the soil, because it generally is unwise, often dangerous, to attempt to aid nature in its growth by artificial means. No other plant is so susceptible to fertilization as tobacco, but with the finer plants, such as yield the cigarette leaf, the demand for its natural nourishment must be exactly met or unsatisfactory results will follow.

Of course, it is always fertilized more or less. Just before the plants are transplanted in the fields, for instance, fertilizer is put into each hill to give the plant a healthy start; but even this must be done with almost scientific exactness. Fertilization tends always to increase the yield of tobacco per acre, but when quantities of nitrogen are added to the soil there is a tendency for the leaf to become thicker, heavier, and more gummy, and, by the same token, ranker in flavor. All these are

cheapening qualities and are highly undesirable in tobacco used in the manufacture of the modern cigarette.

In a word, the chemistry of soil, fertilizer and plant has become an important industrial science, nearly an exact science, and this science has made it plain that, whereas fertilization is highly desirable for tobacco raised for other manufacturing purposes where bulk rather than high quality counts, yet fertilization in any marked degree means deterioration for the finer grades—the cigarette grades—of the plant.

It is, therefore, clear that the question of the quality of tobacco is chiefly dependent upon soil, and nature has so planned that the cream of our tobacco soil, the combination of sand and clay of just the right proportion, is found mainly in Virginia and North Carolina in what are termed the “old belt” and “new belt.”

On these “bright” tobacco lands grows the finest grade, the highest priced tobacco—the aristocracy of tobaccodom—and it is this aristocrat of all tobacco that is utilized in all of our domestic cigarettes. So much for the important question of soil.

It is not, however, in the matter of the necessary soil alone that the superiority of cigarette tobacco is shown. That is again made evident when we come to consider the selection of seed, the growing of the plants and their preparation for transplanting.

The seeds of cigarette tobacco are among



SUPERIOR TOBACCO PLANTS THAT HAVE BEEN SELECTED FOR SEEDS

Tobacco flowers are self-fertile, but the plants cross very easily. Great care is taken to preserve an excellent grade by preventing accidental crossing by wind-blown pollen from flowers of inferior plants. One means resorted to is the protection of the flowers by covering them with paper bags during the period of fertilization, as shown in this illustration. (Photograph by the United States Department of Agriculture)

[illegible]

the miracles of nature. One tablespoonful will produce plants enough to cover ten acres of ground. Centuries of painstaking culture and crossing have been devoted to their development. If sold, they are worth many times their weight in gold; but more often than not they are not offered for sale; they are saved from the perfect plants in the fields and kept from year to year as the choicest property of families of tobacco raisers.

*Seeds Worth
More Than
Weight
in Gold*

Each season the choicest plants in a field are permitted to develop to full maturity and fruition in order to supply the seeds for the coming year, thus insuring the maintenance, or the bettering, of quality. These plants are carefully cultivated with special reference to their essential physiological function, the perpetuation of the species.

Nor is this easy, for, although the tobacco flower is perfect in that it is self-fertile and thus does not depend on winds or insects for the carrying of pollen, there is the disadvantage that the plant crosses very readily. This, to be sure, is sometimes desirable in that it makes it easily modified to meet local conditions; yet it demands extreme vigilance for the prevention of accidental crossing that might result in an inferior grade of seed, or a change of any kind that would alter the character of the next year's crop.

Through this care in the raising of seed individual farmers may be depended upon as the years roll by to supply just the quality of tobacco that the manufacturer of a certain

cigarette requires to maintain the aroma of a particular brand. One generation follows another, and this rare seed is handed down as the choicest legacy. On the quality of the seed the tobacco fortunes of the South have been built.

Like the proverbial woman's work, the work of the tobacco raiser is "never done." Before he has finished curing and marketing the crop of one season he must begin the preparation of the soil for the next season's crop, and this preparation for transplanting tobacco plants is an all-winter operation.

Early in the fall, the land, if it is old, must be plowed to a depth of about eight inches. In February comes the time for a second plowing. Not many other crops need such careful preparation of the top soil. It must be simply scratched over.

About the last of April or the first of May—even earlier, if the season permits—the land must be plowed again to the same depth as in February (three or four inches) and then it must be thoroughly pulverized with drags or harrows and rollers. By this time it is ready for marking off in rows three feet and three inches apart each way, and for the making of hills at the intersections of these rows.

With new land the preparation process is even more painstaking, and the finest quality of cigarette tobacco is grown on new land, virgin soil containing in abundance all of the

elements that are necessary to nourish, flavor and color the growing plant.

All this while there is proceeding the delicate preparation of the tobacco seeds for planting. Each year the plant must be reared from the beginning.

Most farmers have adopted the plan of sprouting seeds before they go into the first seed-beds. To do this the seeds are spread upon several layers of woolen cloth to the depth of about a quarter of an inch. Then they are well covered with other woolen cloths and the whole mass is thoroughly soaked with warm water and placed near a stove in the farmer's kitchen or living-room, or in some other equally warm place. After that they are kept moist with warm water and in three or four days small white spots upon the almost microscopic seeds indicate germination. Then they are ready to be sown in the seed-beds.

While the seeds are thus germinating in the warm house, the farmer and his helpers are busy preparing the seed-beds, which is another of the delicate operations necessary to produce tobacco of the highest quality. The plants must be raised in these beds until they are large enough to transplant.

When new land is used for the beds great care is exercised in determining the proper location. It must be in a sheltered spot sloping gently to the South and well exposed to the direct rays of the sun. Over the area selected for the seed-bed, dry brush is burned until the soil is made hot enough to kill all

seeds of grass and weeds. On old land the baking must make the soil hot at least a half-inch in depth, and on new land the heat must go much farther.

It is an established fact that, besides the advantage of killing foul seeds, the delicate tobacco seeds develop best upon soil that has been baked in this manner. Then with a hoe the earth is stirred to a depth of two or three inches, care being taken to reverse the soil as little as possible, and not to disturb the sub-soil. If an inch of surface soil is removed or the sub-soil brought to the surface, the tobacco plants will not grow.

Next, the earth is raked and worked until the surface is mellow and fine; then fertilizer is applied which, in the case of seeds such as grow cigarette tobacco plants, must be extremely weak. All roots and trash must be carefully eliminated. Trenches must be dug on the upper side and at the ends of the bed in order that rains will not drift the seeds or cause the soil to cover them too deeply.

Now the seeds are ready for planting, and the soil is ready to receive them. Accordingly, the seeds are mixed with dry ashes and sown evenly over the bed. Then they are very gently brushed or raked into the soil, and the earth made compact by treading, leaving the surface smooth and even. But the process does not end there: the cigarette tobacco plant demands as much attention during its immaturity as does a child.

First of all, the beds must be covered in

some manner to protect the seeds while growing. For years a common practice has been to construct a covering of light brush dense enough to shade the plants and to protect them from dry winds and possible frosts. This brush may be kept on the beds until the plants are fully half grown to the size necessary for transplanting.

A more modern method, however, is to cover the beds with canvas. The material used is midway between the common grade and cheese-cloth. This cover is removed a few days before the plants are large enough to be set out. If the seed is sprouted before sowing and the beds covered with canvas, plants large enough for transplanting may be grown in from thirty to forty days.

Not until the largest leaves are two and a half inches wide are the plants ready to be set, and knowing just when and how to transplant these plants that have the delicacy of orchids is one of the most important steps in the raising of the highest grades of tobacco. It has taken generations of expert knowledge to make the tobacco growers of Virginia and North Carolina the acknowledged leaders in the production of high grade tobacco; and their leadership, apart from the influence of the soil and climate, lies largely in their skill at transplanting.

Showery or damp, cloudy weather is the best condition for this process. Then the seed-beds are saturated with water to loosen the soil, so that the delicate plants may be drawn without injury to the roots. Each plant

must be carefully pulled out by itself and laid straight in a position to protect the leaves from dirt. Holes are made in the hills formed in the fields and the plants inserted, only one in each hill, and the earth pressed firmly about them.

It is at this early stage that the dread of the tobacco grower, the deadly cutworm, must be watched for and killed as soon as found. Also during this early stage the fields must be carefully looked over from day to day and good healthy plants substituted for those which do not appear to be doing well, or which have been attacked by cutworms.

Then comes cultivation. In preparing the soil for a crop of tobacco it should be, and usually is, put in such perfect condition that no great amount of future cultivation is required excepting to kill weeds and keep the surface mellow—processes in themselves sufficiently onerous. The best time to kill weeds is just before they make their appearance upon the surface.

The roots of tobacco plants grow very rapidly and soon fill the earth completely between the rows. That is why it is important carefully to cultivate the soil throughout the winter and spring, thus obviating the necessity of agitating it more than is needed to keep it loose and mellow on the surface while the tobacco is developing to maturity.

It is at this stage that a new enemy is likely to appear. This is the tobacco plants' direct

foe, the green hornworm, or hornblower as it is called in some parts of the country, which generally puts in an early appearance, and, from now on, must be ceaselessly hunted and destroyed throughout the tobacco growing season. The hornworm is the caterpillar of a large sphinx moth, which eats the leaves of the tomato and of other allied plants as well as those of tobacco. It is the most evasive of all tobacco pests. The first week of its existence is devoted to eating a few small holes in the leaf near the spot where the egg that germinates it was deposited by the parent moth. This is generally upon a lower leaf where it is difficult to see the holes which indicate its hiding place during the first week of its life, and it is these holes that aid in the worm's detection, if only the grower is vigilant.

Nevertheless, the farmer will not be safe when he has slain one brood. Two, or even more, generations of these worms may develop in a season, and although several methods for the destruction of this greatest enemy of tobacco are known and practiced, no means of permanent eradication have yet been discovered.

Meanwhile, during the development of the tobacco plant, there are three more important processes for the farmer to follow. These are priming, topping and sucker removal.

Priming is the stripping off of the lower leaves of a plant, leaving the stalk bare from six to eight inches above the surface of the hill, a process necessary for much the same

reason that a similar process is necessary in the development of the American Beauty rose. Imperfect leaves must be removed from any part of the stalk, and watching for them must be kept up throughout the growing season.

Topping is the removal of the upper, or flower, stalk of the plant in order that it may not go to seed, and also in order that the leaves which are to be used for commercial purposes may get the full benefit of all the nourishment given to the plant by the soil and the air. By this process from ten to fifteen leaves are left on each plant, according to the nature of the soil and the type of the tobacco, the "bright" variety of tobacco—the variety that produces the superior cigarette leaf—being topped higher than the dark varieties and therefore bearing a larger number of delicate leaves.

Finally, suckers will appear at the point where the flower stalk was broken off. Their unhampered development means the sapping of the plant's vitality. Week by week they must be removed as rapidly as they come, thus insuring the maximum of stimulation to the growing leaf.

Long experience is required for the determination of the exact stage of development at which the plant must be submitted to the first two of these operations; but when that requisite is acquired, the tobacco grower—and especially the grower of cigarette tobacco—is well-nigh an expert. Having followed his plants so far, we may now begin to consider the question of the harvest.

CHAPTER II

HARVESTING AND CURING

Tobacco Ripened as Nature Intended — Curing “Bright”

Tobacco an Agricultural Fine Art—Curing by the Flue

Method—Stripping and Sorting the Leaves—

From Farmer to Auction Warehouse.

MORE than once in the preceding chapter I applied the adjective “scientific” to phases of tobacco growing, and that adjective was applied correctly, for agriculture has long since become a science, with colleges for its especial teaching, laboratories for its branches of research, savants for its investigation, a department in the national cabinet and in each of the state governments. There are experimental stations throughout the country, and there is scarcely one of these that has not given close attention to tobacco raising.

Nevertheless, there are many points at which the cultivation of cigarette tobacco and the manufacture of the cigarette rise from a science to something closely akin to an art, because often the delicate processes involved cannot be subjected to any hard and fast rule, and not the least of these is, as has already been intimated, the length of time that the plants shall be permitted to grow between “topping” and harvest.

A vast amount of experience is needed to determine that, in order to decide on just the

right color and proper stage of maturity of the leaves before the harvest begins.

True as it is of all tobaccos, especially does this apply to the superior tobacco leaves that are used in American cigarettes, and it is at this stage of the culture that the work of experts finally begins to count most heavily.

As a general statement it may be said that the tobacco which goes into our domestic cigarettes is the ripest, most perfect product of nature, because it is always allowed to ripen as nature intended it should. But to insure uniformity of quality, a large percentage of the "bright" tobacco, which is of a precocious character, is taken from the stalks ("pruned" is the technical term applied to the process) as the leaves ripen in the field in advance of their comrades, and these leaves are immediately taken to the curing barn and strung up.

<i>Tobacco</i> <i>Ripened</i> <i>As Nature</i> <i>Intended</i>	the "bright" yellow tobacco, which furnishes the contents of the bulk of American cigarettes, grows to maturity. It means that the leaves have not been harvested until they have been thoroughly ripened, thoroughly sweetened by nature; until they have received the full benefit of the air and soil and have attained, through the secretions of gums and oily matter, their full fragrance and proper texture.
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There is no one that does not appreciate the difference in flavor between fruit ripened



A FIELD OF "BRIGHT" VIRGINIA TOBACCO

Grown on the clay and sand soil best suited to the raising of highest grade domestic cigarette tobacco, the highest priced tobacco in the United States. All of this tobacco gets the full benefit of nature by being allowed to ripen "on the hill." The plants here shown are approaching thorough ripeness and are about ready for harvesting.

[illegible]

on bush or branch, receiving the supreme beneficent touch of the sun which completes the chemical process of natural ripening, and fruit that is picked green and left to ripen on a shelf, or is brought to edibility by some unnatural, artificial means. Now, there is just that difference between the flavor, the aroma of tobacco picked green and the golden leaves grown in the best Southern soil which go into the popular American cigarettes. They have been sweetened by nature, bathed to the last day in the pure air of the hill countries, in the district of famous health resorts; they have the fragrance, the mellowness, the thorough ripeness that the laws of life intended them to have.

Thus it is with this sensitive species of plant now become a thoroughbred, that the grower has to do, and it is easy to see how he must be guided only by the utmost nicety of perception toward its harvesting, must seize the precise moment, determine almost to an hour its stage of perfect ripeness. He watches, as a mother watches her child, the intensifying green of the tobacco leaf, which indicates that it is rich in the nitrogenous properties that constitute its vitality and furnish its food supply.

*Properties
of the
Tobacco
Plant*

He knows that, after "topping," the food stored by the leaf is not carried to other parts of the plant, remaining instead in those leaves and accumulating there, and that, as a result of this, there is an increase in the size and body of the leaves greater than that in any

other of our common agricultural plants.

Day by day, the expert sees this food supply deposited as starch granules in the maturing tissues. He knows that the interchange of ingredients will manifest itself in light-tinted flecks on the ripe product, that the accumulation of the starch will make for the brittleness that is one of the surest signs of a ripened leaf. Aware that this replacement has a marked effect on the flavor, color and elasticity of the tobacco, he follows it with a scrutiny well nigh intense and, when he sees the work at the height of its efficiency, he orders the harvest to begin.

That harvesting is, of course, one of the most important steps in the long line of the process to which the yellow tobacco is submitted in its journey toward the completed cigarette—a journey, by the way, that lasts from three to five years. It is the first step in a journey that changes the tobacco from an agricultural plant to a purely commercial commodity.

Although tobacco should be planted in showery, or at least damp weather, it must be harvested only on days that are dry in order that the leaf may be absolutely clean, unspotted, and free from the various fungus growths which are certain to attack it unless, in its curing, it is carefully handled by experts of long experience who have an eye for such perils.

Because of similar reasons, the doors of the curing barn, and the ventilators on its sides, must be kept open for several days before the harvest and the whole interior of the building

thoroughly aired. Indeed, the curing-barn should be in complete readiness, for it is essential that it be entirely filled in one day, since the curing process begins immediately after the tobacco is put in, and every hour brings about changes that seriously affect the quality of the product.

Now the harvesters enter the fields. They cut the plant from the ground, stalk and all. First the stalks are split with a thin knife from the top down nearly to the bottom leaves and then are cut off below those leaves. The tobacco plants are next put on laths. Six or eight plants are put on each lath, and in this manner they are hauled to the curing-barn and hung upon poles, the laths being placed from six to twelve inches apart. As soon as the barn is full, all loose leaves and trash are removed and the place is made clean and sanitary.

One might suppose that now the farmer could close his barn doors and wait fruition. Not so. It is at this stage that the grower of tobacco in general has to guard against a danger from the greatest of all menaces in the curing barns the world over. That is what is known as pole-sweat, or house-burn. It is a disease caused by some of the lower organisms which attack the constituents of the tobacco leaf that give it stiffness and toughness. The leaf so attacked simply falls apart, because the tissues have been softened and have lost their coherency. Pole-sweat occurs in periods of prolonged wet,

*Menaces
in the
Curing
Barns*

humid weather accompanied by relatively high temperatures and is encouraged when plants are crowded too closely together.

Indeed, once the tobacco is in the curing barn, the thermometer plays a very important part in its further perfecting; but the tobacco grower long ago learned that the tobacco leaf itself is more delicate, more sensitive to temperature, than the most delicate scientific instrument. It is even a common practice in the tobacco country to use a tobacco leaf as a barometer, because it accurately foretells any atmospheric changes. True, cigarette tobacco is less open to pole-sweat and similar perils than are other tobaccos, because the cigarette grade is more closely guarded, and because it is entirely cured in barns warmed by a nicely graduated artificial heat that makes their interior practically independent of outside weather conditions. But this only makes the expert the more busy. Since he is free of the weather, he must be bound to the regulation of his heating plant.

Although the physical characteristics, as well as the composition, of the tobacco leaf are greatly influenced by climate, soil and fertilizers and the skill of the growers, the quality of the finished product depends in even larger measure on the care and skill displayed in the curing and fermentation of the leaf. It is therefore evident that, of all the important crops in this greatest of all agricultural nations, there is none which is so dependent on the care, skill and judgment of its producers as tobacco. A crop of the highest

promise may, under unfavorable conditions, be irretrievably damaged in the curing barn.

As may be easily shown, curing means a great deal more than mere drying. If a tobacco leaf taken from a plant at harvest time were put into an oven and dried rapidly, and then rolled into a cigar, or some other convenient form for smoking, it is doubtful if any consumer would recognize it as tobacco. Curing, in brief, involves a number of important changes in composition which may be brought about only under well defined conditions carefully produced.

Years since, it was found that the important properties of the leaf could be forced to develop along quite different lines by modifying the conditions of curing. The most valuable qualities of one type may not be at all desirable in another, so the grower must first acquaint himself with the trade requirements of the particular type which he can produce to best advantage, and then determine as nearly as possible the most favorable conditions of curing for the development of its finer qualities. Knowing just what the manufacturers of cigarettes require in order to maintain their standards of quality, the growers of "bright" tobacco in the "old" and "new" belts of the South have indeed brought the raising and curing of the best cigarette tobacco in the world to an agricultural fine art.

*Curing
"Bright"
Tobacco an
Agricultural
Fine Art*

Of course, in the early stages of the industry, methods were rough and ready, and then

all tobacco was either sun cured by hanging upon scaffolds out of doors for from five to ten days, and then air cured in barns; or, in many districts, it was cured over open fires. But, excepting for coarse cigar and chewing tobacco, these methods of curing are now obsolete, and today all the cigarette tobacco in this country is cured by the flue method, which is the best process that has been devised for keeping the product pure, and assuring the retention of its full flavor.

Science and the work of experts figure prominently in this difficult process of curing "bright" tobacco with flues, and much practice is required to insure the perfect results that have to be obtained.

Each grower of "bright" tobacco has one or more of these curing barns on his plantation, whither the tobacco that has been ripened by nature is taken directly from the fields. The barns, still mostly built of logs, are one of the most distinguishing features of the landscape in the "bright" tobacco states. An unusually successful planter may have five or six of them clustered conveniently about his house. The curing barn is practically air tight, but is provided with ample ventilation, which may readily be controlled.

The farmer and his expert helpers must study each crop that he raises, and thereby determine just the manner in which it shall be handled in the curing barn. The sap is the life of the leaf, and the object in curing is to expel the sap in such a way as to make the leaf

the desired color, and to prevent, by improper, or too slow, or too rapid curing, the exudation of the juices which give tobacco its flavor and suppleness. The amount and quality of the sap must determine the degree of curing to which the tobacco is to be subjected.

After the tobacco enters the curing barn constant vigilance is the price a farmer must pay in order that his crop shall not be ruined in this vital stage of its development. He must watch the curing process day and night, for a change of a few degrees in the temperature would be more than likely to ruin every pound of tobacco and make his year's work a complete failure.

*Curing
by the
Flue
Method*

The distinctive feature of the flue method of curing tobacco is that the curing barn is equipped with a system of large pipes through which air from furnaces heated to varying temperatures is passed throughout the curing. The smoke, of course, does not come in contact with the tobacco, as it does in the open fire method of curing, which is altogether out-of-date so far as cigarette tobacco is concerned.

One of the most popular methods of curing this "bright" tobacco with flues, which will vary slightly as to degrees of temperature with local or seasonal conditions, may be described as follows:

First comes the yellowing process, during which, for from twenty-four to thirty hours, the tobacco is submitted to a heat of from 90

to 100 degrees, permeating every foot of the area of the curing barn.

The remaining processes are for the fixing of color, the curing of the leaf and the curing of the stem and stock of the plant. To carry out these processes, the temperature is raised two degrees an hour up to 130 degrees, where it remains until the leaf is cured, when the heat is raised gradually to 170 or 180 degrees, this latter process comprising the curing of the stem and stalk.

The principal changes in composition brought about in curing are dependent on the life of the minute cells in the leaf. It is the extent or completeness of these changes that characterizes the difference between air curing and flue curing. The typical "bright" yellow tobacco, such as goes into cigarettes, being ripe at the time of harvest, is relatively richer in starchy matters than the coarser tobaccos that may be cured without the use of heat.

Notwithstanding the fact that the brownish color desired in cigar tobacco develops from the green of the leaf, the yellow color in cigarette tobacco is not formed directly from the green, but is already present in the growing leaf. The rapid appearance of the yellow color in the nature-ripened cigarette tobacco does not afford sufficient time for the transformation of all the starchy matter; so as soon as this stage is reached the curing must be hastened to prevent any further change of color.

The real object of the cure is the killing of

the leaf. That sounds paradoxical, but it is so. It is one case where the "cure" kills with a beneficent purpose. The cure is finished when the midrib of the leaf where it joins the stalk is dead, and has become so dry that it will snap when bent between the fingers. But the killing is a long, painstaking and watchful, though gentle, process. Temperature, the humidity and moisture in the air inside, and to some extent outside, of the barn, and most of all ventilation: these are the leading factors.

*Ventilation
Plays an
Important
Part*

Delicate as it is in some respects, the tobacco plant has wonderful vitality. Parts of the leaf will, under favorable conditions, continue to "live" in the curing barn for several weeks.

Let us follow this march of death. It is the outer edges of the leaf that are the first to succumb from loss of moisture, and the unused portion of the food supply is withdrawn toward the midrib, which is the last part of the leaf to die. Then the food materials pass into the stalk to keep this alive and to supply nourishment to the young "suckers," which, even during the slow death in the curing barn, keep up the fight to the end in their persistent effort to perform their function: the function of reproduction.

These often hold out for many weeks before they are starved to death; but, because the stalk of the "bright" cigarette tobacco has been slit open almost its entire length, and because it is always cured by artificial heat, this struggle is very much shorter in the case of

such tobacco than it is in other varieties.

The next problem that presents itself to the expert is one of color. As soon as the leaf has become yellow, the drying must be so regulated as to prevent any further change in the shade of the leaf, and this "fixing the color" stage is a critical period that requires the closest attention. When the leaf tissue dies, all moisture remaining in the leaf comes to the surface and unless removed will turn the leaf a reddish-brown. That is called "sponging," and is undesirable in cigarette tobacco.

Here again the curer's watchfulness must not be permitted to relax. The temperature of the barn must never fall, and extreme care is necessary to avoid deterioration. Any too rapid advance, and any carelessness in ventilation are likely to produce trouble technically known as "scalding" or "splotching," which result in bluish-black discolorations that are not to be tolerated.

But now suppose all these precautions taken, and all these dangers safely passed—the tobacco is cured. What is the next step in the long journey of the tobacco to the consumer? It is the stripping and sorting of the leaves.

*Stripping
and
Sorting
the Leaves*

Once the tobacco is properly cured, the plants may be taken, as soon as the farmer pleases, from the laths on which they have been suspended, and the leaves then stripped from their stalks. There is only the weather to be consulted. It is at this stage, immediately upon the completion of the cure, that

the planter anxiously watches for a "tobacco season," for the stripping must not be done until after damp weather has prevailed long enough for the leaf to become pliable, so that it may be handled freely without breaking.

Tobacco in that condition is said to be "in case," or "in order"—in "farmer's order" as distinguished from "purchaser's order," which comes later. Weather well adapted to bringing the leaves into "order" following the curing is what has become known in the tobacco country as a "tobacco season" or, in some localities, as a "tobacco storm"; but even though wet weather prevails, the leaves will not "come in order" if the temperature is very low.

The plants have now been lowered from the poles and removed to the packing house, where they are piled in heaps with all the tips turned inward and overlapping to prevent the leaves from drying out. It is in this "pack house" that the leaves are stripped from the stalks at the convenience of the owner and of the weather.

After stripping, the leaves are sorted and the different lengths, qualities and colors tied into bundles, called "hands," weighing about half a pound each. A leaf is used to bind the bases together, and all leaves that are in any way damaged are thrown out and only the highest quality taken for cigarette purposes.

Next the "hands" are arranged in piles called "bulks," on an elevated platform. These "bulks" are built by laying the "hands" in two rows; all the butts outward and the tips slightly overlapping. Then, to prevent the to-

bacco from drying out, the "bulk" is covered with oilcloth or other suitable material.

Now the tobacco is ready to be taken to market. But until it is taken from the packing house and loaded into wagons to be hauled away, there is another period of anxious watching. The piles of bundles must be saved from the heat which is likely to develop if the leaf was too moist when packed. If heating does occur, the piles have to be torn down, the bundles shaken out and the piles rebuilt.

The farmer's part is now nearly finished. All that he awaits is a favorable market for

*From
Farmer to
Auction
Warehouse*

the product that he has been anxiously and skillfully bringing to perfection for the better part of a year; and, in the case of this "bright" yellow tobacco, he never has long to wait provided his work has been successful, since there is always a demand that exceeds the supply of the better grades. So the raw material begins its travels by an early start to the farmer's market place, in other words, to one of the tobacco auction warehouses that are scattered throughout the tobacco belts.

These auctions are among the most picturesque features of Southern life. For the most part, the warehouses in which they are held are at convenient points; but sometimes a farmer will have to make a four days' journey to reach a warehouse where the quality of his tobacco is known and appreciated and will, consequently, bring the highest price. Many of the old-fashioned, boatlike tobacco wagons

once entirely peculiar to this region are still in use, and a familiar winter sight is the lines of these vehicles going to market.

The element of the picturesque continues in the warehouses themselves, with the auctioneers repeating the bids in sing-song as they pass from pile to pile of tobacco followed by groups of buyers, and knocking down each separate pile to the highest bidder. The bright leaf that goes into our most popular cigarettes, even those retailing at ten and five cents, is always among the lots that go at the highest figures.

Buyers for the different brands of cigarettes attend these auctions daily and display a fine skill in selecting just the kind of tobacco that will maintain the distinctive flavor of their particular brands. So expert are they that they can tell by a glance from what district a pile of tobacco came—not only from what county, but often from what particular farm. They see the tobacco as it is unloaded, and again in the piles, and they have, for the most part long before the bidding begins, made up their minds as to just what lots they want to buy.

The sing-song of the auctioneer continues until the early winter twilight has fallen. The old wagons, empty now, begin to jolt homeward. The auctioneer is silent. The buyers are directing porters to gather their purchases together for shipment. Nature has done her utmost with the tobacco; the farmer has done his: processes of another sort are already beginning their labors.

CHAPTER III

TOBACCO STORAGE AND BLENDING

Four or Five Years' Labor in Each Cigarette—Business Makes South Prosperous—Prizing into Hogsheads for Storage—Mellowed by Two "Sweats" Each Year—Blending of Crops Makes Uniform Quality—Importance of Large Capital in Business.

MAN first created civilization and then became its creature. The result once achieved, the means is forgotten. Few have any conception of the processes that go to the making of the most familiar objects of our daily life. Ask, for instance, the average citizen how chocolates are made, and he will say:

"Chocolates? Oh, it's perfectly simple. They're made in a big factory where they mix a lot of sugar, flour and cream together, chop it into little pieces and pour chocolate over them while they are sticky."

Ask him how pins are manufactured, and he will answer:

"Why, by pushing wire into a machine that turns it into pins."

Ask him if he knows how cigarettes are made and he will say:

"Sure I do. They're made by machinery. A lot of chopped up tobacco is fed into a big machine operated by a girl sitting on a stool, and the machine automatically wraps the tobacco in paper of the right length—and that's all there is to it."

In other words, the average citizen has no conception of the infinite amount of care and labor that is needed to bring the raw products of the chocolate candy or pin industries up to the manufacturing stage. He has no conception of the processes of any industry save that in which he happens to be personally engaged.

And so this same average citizen, as he smokes his cigarette while attending to his more or less important affairs, does not realize that the making of that cigarette in those machines of which he has such a crude idea is only one of many operations in a long succession of carefully planned and painstakingly executed processes which, in the case of the standard cigarettes that today are sold by the billions, extend over a protracted period,

It takes from three to five years to make a cigarette. That is to say that every cigarette you smoke, even the two for a cent kind, represents an investment of labor for three, four or five years, and, in the aggregate, millions of capital tied up for that time. Indeed, the actual making of the cigarette in the factory where the filler and wrappers are combined in the finished product is really but a minor process in the long line of operations.

*Four or Five
Years' Labor
in Each
Cigarette*

What counts most, and what no invention can ever accomplish, is the careful, expert preparation and the skillful blending of the tobacco. No machine on earth could possibly make a good cigarette out of poor tobacco;

and it may as well be added that no machine in the United States makes cigarettes out of any but good tobacco, popular rumor to the contrary notwithstanding. For as was stated in a preceding chapter, there are good reasons, other than keen commercial competition, why nothing but pure tobacco is used in cigarettes, and the difference in quality is simply a question of the kinds of tobacco used.

It is this process of blending that we have now to consider; but it will be necessary first briefly to trace the tobacco from the auction warehouse, where we recently left it, through its stage of "reordering," since, without that reordering, the best of blending might very well be of no avail.

No sooner has the leaf passed into the hands of the agents of the various cigarette manufacturers than there begins a series of most important steps, calling for a wide range of technical skill in the perfecting of the raw material, that treatment of the tobacco in storage which gives to it the flavor, the mellowness and the sweetness that come with age.

Those towns and cities where are established the tobacco storage warehouses in which the next step is taken are the real commercial centers of the South. They are a prize worth any town's fighting for, and there is much strife among municipalities to secure them, for they are constantly building up into prosperous and bustling cities many places in North Carolina, South Carolina and Virginia.

*Business
Makes
Southland
Prosperous*

Often from 15,000 to 50,000 pounds of the cigarette type of tobacco are sold in a single warehouse in a day, and in some centers there are several of these warehouses. The tremendous sales during the season, all "spot cash transactions," distribute immense sums of money to the planters of the vicinity, and the community's general business reaps the benefits.

In the older districts of the "old belt" and the "new golden belt" have sprung up Tobacco Boards of Trade, banks, and all the appurtenances to a large and thriving commerce. Nor is that all. Of no less importance to the small markets than the auction warehouses themselves are the complement of "prizing" houses, and what these are to the smaller markets, the redrying plants have become to the large ones.

It is in the "prizing" houses of the smaller markets that the tobacco is put into hogsheads to ship to the redrying plants in the large centers.

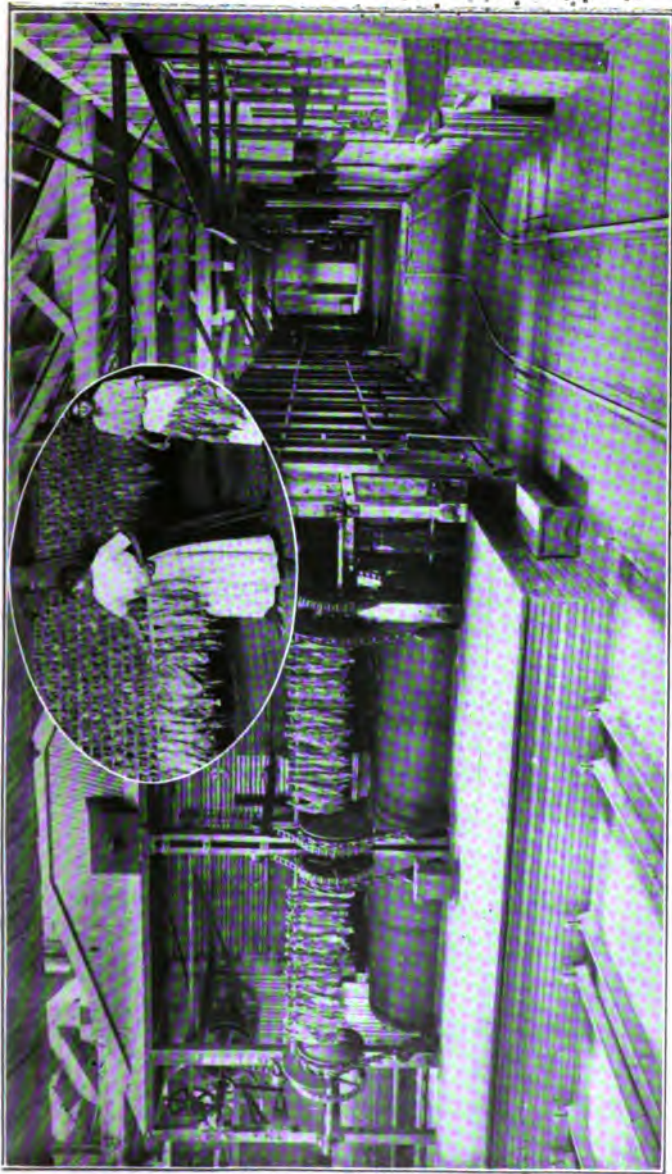
Immediately after a sale, the raw material is removed from the auction warehouse in flat-bottom baskets, each holding from 100 to 400 pounds, and in these it is hauled to the "prizing" house, or to the redrying plant as the case may be. The word "prizing" refers to the final act of prizing, or pressing the tobacco into the hogsheads in which it is sent to the storage warehouses to be kept until it is thoroughly "aged."

First, there is the process of reconditioning,

or reordering the tobacco, or as it is often termed, redrying. When the planter delivers his crop, it is said to be "in order," or "in condition," which means that it contains what he considers the proper amount of moisture after the curing process. But this "farmer's order" never is the order that suits the purposes of a purchaser. Therefore, the first thing to be done in the prizing house is to take out the farmer's order and put the purchaser's order in. It is then said to be reconditioned, reordered, or redried.

The purpose of this is at once evident. It is to take out the greenness, or "newness" of the tobacco and to put it into proper condition to age, or sweat, without damage. The machinery for doing it—or the machine, rather, for it is accomplished by one monster mechanical device—has been brought to a high degree of efficiency. The most modern of these redrying machines is a sort of huge double compartment oven, one hundred and forty feet long, twenty-two feet wide and twelve feet high, having within it an endless wire belt which revolves over rollers placed at either end. The interior of the machine is divided into five chambers, or compartments.

The process begins by taking the tobacco from the baskets and hanging it upon sticks, which are automatically fed into the machine. The leaves are then carried through from one chamber to the next, and held in each as long as necessary. In the first chamber there is a



AUTOMATIC MACHINE FOR REDRYING DOMESTIC TOBACCO

In the oval at the top is shown the process of feeding the tobacco hung upon sticks into the machine. On ratchet chains it is carried through five compartments in the 140-foot-long machine and is redried, cooled and then "ordered" by passing through steam. Emerging, as shown below, the tobacco is put into hogheads that are run up to the platform on the tracks in the foreground. Each machine redries and reorders as much as 70,000 pounds of tobacco per day.

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heat of 130 degrees, in the second 150 degrees, and in the third the temperature reaches 170 degrees. By the time the leaves have been carried through this hottest chamber the tobacco is bone dry. In other words, all of the "farmer's order" has been removed. Then the tobacco passes to the cooling chamber, where the temperature is as low as 90 degrees. From that it goes into the last chamber, where it encounters the live steam that puts it into such "order" as is required by the manufacturer of the particular cigarette for which it is intended. A full hour is the average time required by the whole process.

Each of these modern redrying machines, which now are in quite general use, redries and reorders from 40,000 to 70,000 pounds of tobacco leaves in a day. The old air, or ventilation method took from forty to ninety days to accomplish what one of these machines does in about sixty minutes. This is another instance of replacing the crude primitive methods of hand work by modern mechanical devices adequately directed, a change that is everywhere characteristic of American enterprise.

Once the tobacco has passed through the redrying machines, it is taken off the sticks, packed into hogsheads and then "prized," or pressed, by a power-press made for the purpose, into the hogsheads in which it is to be kept in the storage houses.

*"Prizing"
Into Hogs-
heads for
Storage*

The hogsheads are made from kiln-dried Southern pine, a soft wood that makes a suffi-

ciently porous, sweet container excellently adapted to keeping the tobacco in perfect condition during the aging process. To pack the leaves, there is put upon each hogshead a pressure of from 1,000 to 1,100 pounds.

Thus reordered and prized, the tobacco is now ready for storage. Much of it is kept where it is prized; but where the storage facilities are inadequate, as is often the case, the hogsheads are shipped to the greater storage warehouses, notably those in Richmond and Danville, Virginia, and in Durham, North Carolina, which doubtless are the largest cigarette tobacco clearing house cities in the country. It is best that the tobacco should age, or sweat, in approximately the same climate in which it is grown.

Ventilation is even more necessary at this stage than in curing. Consequently, the storage warehouses are all well ventilated and many of them are simply vast open sheds with dry floors, the more modern being built of metal and concrete, in which the hogsheads are piled two or three deep. Even in the frequent brick warehouses there are numerous windows which, when opened, allow a clean sweep of the pure air to circulate around the valuable stock. In none is any artificial heat applied. It has been found best to depend solely upon the climate for this process.

"Process" is the proper word, for one must not get the impression that this storage is merely for the purpose of keeping the tobacco until it is needed for manufacturing into cigarettes. Just as nature—Mother Earth and



METHOD OF "PRIZING" DOMESTIC TOBACCO

After it is redried and "reordered" the tobacco is firmly pressed, or "prized," into hogsheads by a hydraulic press, as shown in the top picture. The bottom picture shows how the leaves, tied into "hands," each weighing about half a pound, are neatly pressed into layers. In these hogsheads, averaging a little over 1,000 pounds, the tobacco is sent to warehouses and stored from three to five years, being mellowed by two natural "sweats" each year.

THE NEW AMERICAN

Father Sun—"sweetened" the tobacco during the growing in the rare, pure air, so here, in the warehouses, nature again takes up her task of "mellowing" the leaves by age—or, as the tobacco man calls it, "sweating."

That is exactly what the tobacco in the hogsheads does—it sweats. As has been said elsewhere, no other plant that grows is so susceptible to soil conditions as is tobacco, and by the same token, the leaves of no other plant are more sensitive to climatic changes while in storage. Therefore, the tobacco sweats, and when it sweats it becomes limp and soft. It goes through two of these sweats each year—in the spring when winter is changing to summer, and again in the fall when summer is turning to winter.

*Mellowed
by Two
"Sweats"
Each Year*

The result is a thorough moistening. The sweat permeates every one of the tens of thousands of leaves in each hogshead. This is an inexorable law. So susceptible is the tobacco to these two great climatic changes that if it were stored in the strongest safe and the doors of the safe never were opened, the leaves would go through a sweat each spring and fall.

In the interim between the sweats the entire contents of the hogsheads dry out. By the "age" of tobacco is meant the number of sweats to which it has been subjected.

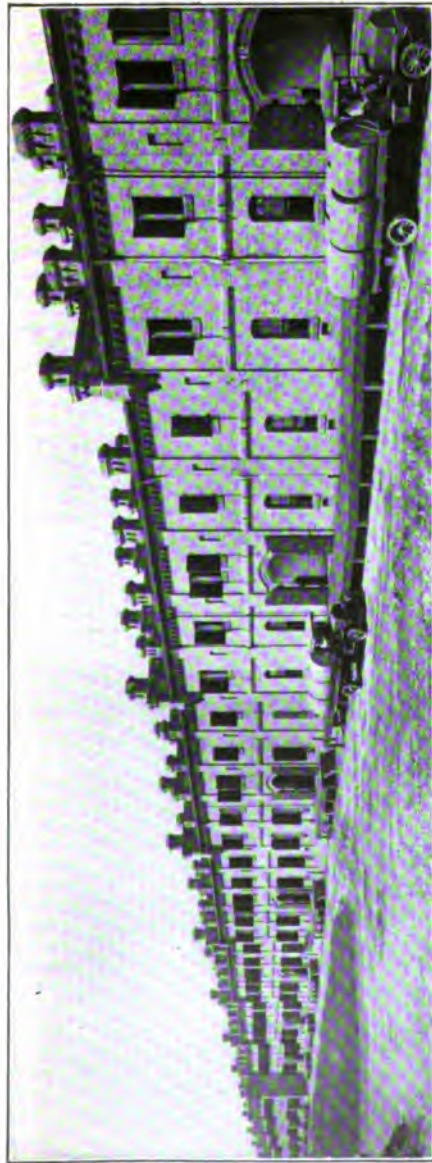
"From three to five years' imprisonment in the warehouse" is the sentence that is imposed upon each and every crop of tobacco

leaf that goes into the manufacture of American cigarettes. That is to say that there are from three to five crops as many years old continuously being mellowed by age in the warehouses after they have been sweetened by nature in the fields.

This is the reason why the tobacco in our cigarettes, recognized as the best in the world, is temptingly and honestly referred to in advertisements as "sweet" and "mellow." The phrase is just. In fact, the incarceration could continue much longer, for tobacco that has been properly cured and favorably stored will keep practically indefinitely, and will go right on sweating twice each year as regularly as the two major seasons change; but, for all ordinary purposes, three or four years suffice to bring the leaf to perfection.

When such perfection has been secured, the tobacco is taken from the hogsheads and re-
Removing conditioned by again being
the passed through live steam re-
"Backbone" duced by cold water going
of the Leaf through atomizers, and put in
 condition for stemming, or
 "stripping," a trade which gives employment
 to many thousands of people the year round.

The phrase "to stem" means to remove the midrib, or "backbone," of the leaf. This is sometimes done by hand, but more often by machines operated under the guidance of skilled laborers. By the removal of the coarse stern, or midrib, the leaf is separated into two parts technically called "strips." •At the



TYPES OF WAREHOUSES FOR THE STORING AND AGING OF DOMESTIC TOBACCO

In the top row of brick stores in Durham, North Carolina, as much as 22,000,000 pounds of the celebrated "Virginia" tobacco suitable for domestic and blended cigarettes are stored at a time. Below is one of several modern metal and concrete warehouses of the American Tobacco Company in Reidsville, North Carolina, each with a capacity of 2,000,000 pounds.

same time the coarser and tougher veins radiating from the midrib are removed.

Until now there has remained in the tobacco leaves a certain amount of sand and clay. A good deal of this dust clung to the plants at harvest. Some has come out in the various handlings during the curing, more in the auction warehouses, and still more in the redrying plants. But it is necessary that every particle be removed, and it is during this reconditioning and stemming process—one portion of which includes the passing of the tobacco over “shaker” sieves—that the remaining sand is shaken out, and other foreign substances dislodged and removed, so that there is nothing left when the actual assembling of the cigarette begins but pure tobacco, mellow and clean.

In the process of making the strips the loss of weight by the removal of the midrib is from twenty-five to thirty per cent., and you will understand what that means when you remember that this “bright” yellow cigarette tobacco commands the highest market price of all tobaccos. In this same process, too, practically all of the sap left after preceding processes (which, to be sure, is not much) passes away.

It is a good time to call the roll and count the missing. Submit the cigarette tobacco at this stage of its preparation to chemical analysis, and you will find that there has also vanished the major portion of the nicotine originally inherent in the plant.

Curing, warehousing, the heat treatment, the sweating, the passage of the years—these

things combine until, as will be shown in a later chapter, the amount of nicotine left for the finished article is relatively unimportant.

This loss is significant. If, as in the cultivation and handling of the sugar-beet where the prime object is the production and the retention of sugar, the prime object in tobacco culture were the production of nicotine, then an increase in nicotine might easily be forced by fertilization. But it never is. Good tobacco is not made by nicotine alone, any more than good wine is made by alcohol alone. Flavor and aroma are the two important elements. Some cigarette tobaccos famed for their excellence contain almost no nicotine, and upon nicotine neither the excellence of the leaf nor its smoking quality is dependent. Thus early is disproved a popular fallacy.

That, however, is matter for future and detailed consideration. What here concerns us is the preparation of cigarette tobacco for the factory, and we have now reached the most important of all the various stages that the tobacco passes through on its journey of years from seed to smoker. This is the blending process, and here it is that skilled workmanship counts to the greatest degree in all our story.

Since it is the blending of the different crops, which have been selected with such care and have been stored for years, that enables the manufacturer of American cigarettes to keep the quality of his product always uniform, and since it is because of the blending of several crops that

*Blending of
Crops Makes
Uniform
Quality*

cigarette quality can always be evenly maintained, it is obvious that the employer cannot afford to employ a poor grade of labor at the tasks of assorting and blending the great variety of tobacco leaves.

Consequently none but the most careful workers, those selected for their superior skill, are employed in these departments.

Good sight is necessary; individual attention is a requisite, and a correct judgment as to qualities of leaf is paramount. Failure on the part of the employee—carelessness, inefficiency, inattention—spells ultimate disaster to the employer. If he is actuated by no higher motive than the primal one of self preservation, the cigarette manufacturer must here use only the best material, the highest skill, the greatest care.

For the cigarette, in this vitally important matter of blending, is *sui generis*. The tobacco that goes into cigars, for instance, requires no such blending of crops. That is the reason that the cigarette smoker can be sure of having his taste gratified, and that his favorite brand of cigarettes always will be of the same flavor and general quality, while the smoker of any brand of cigar cannot. It is this maintained quality—a maintenance due to the blending of crops—that, added to the convenience of the cigarette, is really the largest factor in the phenomenal increase of cigarette smoking.

Nor is it only the tobaccos of different years

that are blended for the cigarette. In order to procure the precise flavor needed for a given brand, tobaccos of different grades must be blended, and tobaccos from different sections of the yellow tobacco districts. In this respect the larger manufacturer has a clear advantage over the smaller, because of better facilities for keeping on hand a big stock of tobacco for excellent blending.

Importance of Large Capital in Business

Indeed, since the coming of large capital to the cigarette industry, the general quality of cigarettes has been improved. Only the investment of much money—and it runs into many millions of dollars a year—permits the manufacturer of cigarettes on a large scale to carry over crops in storage from season to season and thus keep up the standard of the tobacco used in his product.

Moreover, the crop of one season is often vastly inferior to that of another, so that unless the manufacturer has sufficient capital to enable him to keep two, three or more crops on hand—or even to skip entirely the crop of a particularly bad season—he cannot be sure of maintaining uniform quality in his cigarettes.

Few smokers, carelessly puffing their cigarettes, realize the years of labor that have gone to the making; nor do they surmise what great skill and vast capital are represented in the fragrant, curling smoke. Just so, not one in a thousand appreciates the fact that, with each inhalation, he is drawing upon a small portion of about three crops of tobacco.

There is as much distinction in the “vint-

age" of tobacco as there is in the vintage of wine. Everybody knows that the grapes of a certain district in France make, in favorable seasons, vintages that connoisseurs proclaim the aristocrats among wines. In the same manner do particularly favorable growing and maturing seasons in certain districts of the "old" and "new" tobacco belts make a superior quality of cigarette leaf.

Large capital enables the manufacturers not only to pay the highest price for this cream of the crop which they need for maintaining their standards, but also to store this tobacco of the rarest "vintage" in such quantities as to be always available until equaled by a subsequent crop.

For stored it is again, this now perfected product. Once out of the warehouse, blending accomplished, it goes back into hogsheads and bondage, ready for shipment to the factories when needed, but likely to stay a long time on the waiting list before the hour strikes for its conversion into the form in which the smoker first makes its acquaintance. Before that introduction occurs there is another side of the industry to be inspected—and that is a side deserving a chapter to itself.

CHAPTER IV.

PREPARING FOR MANUFACTURE

First Process in a Cigarette Factory—Where Turkish Tobacco Comes From—Why Best Turkish Cigarettes are Made in America—Overcoming Dishonest Native Packing—Blending—Turks and Greeks Employed in Factories.

S EED selection and culture; leaf selection and curing, reordering, aging, stemming, blending and repacking! Surely, says the layman, the cigarette tobacco must now be perfect; surely it is ready to pass directly into the paper and thence to my own lips.

Not so. The manufacturer has a better care of your comfort than you have, and in his factory, when the tobacco reaches it from the warehouse after blending, he exercises the maximum of painstaking energy. There he can, and does, renew the processes of purification and perfection; and there he can, and does, go about this task with an attention to detail that makes the preceding regimen—important and expertly managed though it invariably is—seem crude and experimental.

Since, of course, these last steps are but accentuated repetitions of steps formerly taken, one example will suffice. No sooner has the “bright” Southern tobacco reached the factory than it is put into a steam-room, or sweat-room, as it usually is called, and kept there at

a temperature of about 110 degrees until it is in a condition sufficiently pliable to prevent its breaking while being handled.

This is really another reconditioning, or re-ordering, of the tobacco into "factory order"; and there are more "ordering" processes before it finally reaches the cigarette making machines—which is enough to show that the keeping of the tobacco in good condition, or "order," is the master-key to the success of the cigarette manufacturers. whose businesses have grown to such large proportions in the United States.

Still in the hogsheads in which it was shipped from Durham, Richmond or any of the storage warehouse centers, the domestic tobacco is housed in the steam-room. As needed, the hogsheads are rolled out and opened in the first of the many rooms through which the tobacco travels in the various stages of its journey to the cigarette making machine.

*First
Process in
a Cigarette
Factory*

In that first room expert workmen, men who have been judges of tobacco quality all their mature years, open the hogsheads, carefully examine the strips and remove all leaves that are too dark, or are in any way not up to standard for cigarettes. All hard grades—that is to say, those in which the leaves may have been firmly matted together—are rendered pliable and put into proper order by being passed through a revolving cylinder in which there is live steam.

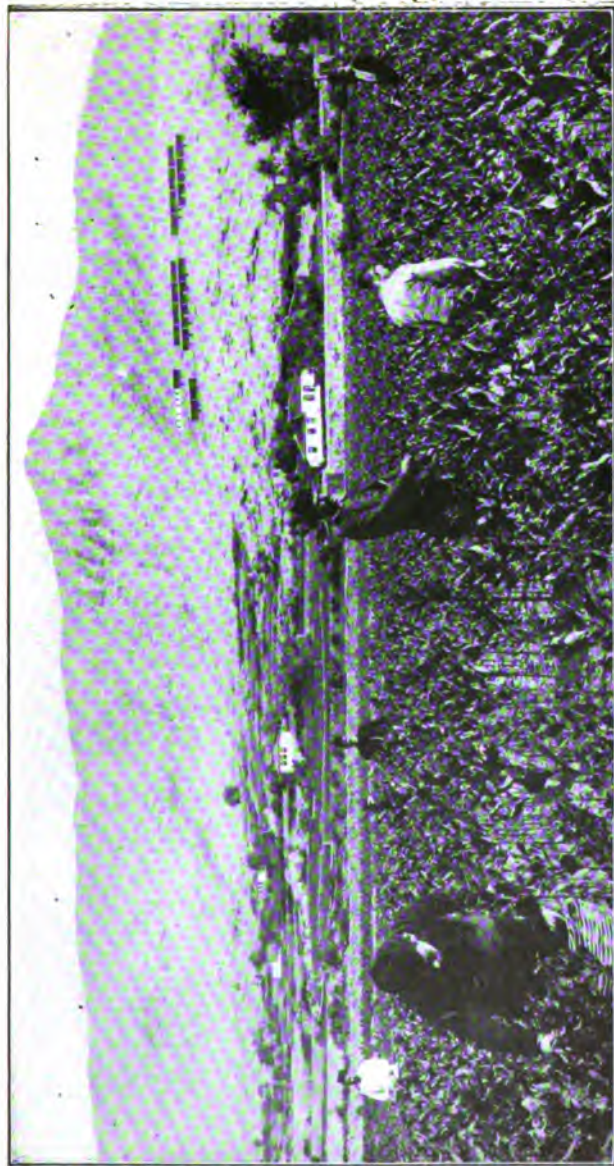
You will recall that all of this domestic tobacco is blended according to the formulas of the different brands of cigarettes before being shipped to the factory. Here, after the harder strips are softened by passing through the revolving cylinder, the balance of the blend is mixed with them and the leaves are put into trucks, soon to begin their journey through the many factory processes by which the actual cigarette is made.

I have been writing chiefly about domestic cigarette tobacco. Now it is fitting that I should here break the thread of my narrative to record a few facts about Turkish tobacco, which has become of late years so important a factor in the cigarette industry,

Once again we must consult our histories. It is interesting to note that while America is the birthplace of tobacco and has always produced the greater portion of the world's supply, we have had to go to the Orient for the most delicate and aromatic leaves that are used in cigarette manufacture.

Only a short while after the discovery of America, traders carried the seeds of the new plant to all known parts of the globe. The Orient received them gladly, and in the soil of the East the tobacco lost many of its native characteristics and took on that texture and aroma that spell excellence in the cigarette smoking of today.

At the outset it should, however, be noted



A FIELD OF TOBACCO IN TURKEY

This is the type of tobacco that is used so extensively in the manufacture of high-grade Turkish and so-called Egyptian cigarettes in the United States. The leaves are picked from the stalks as they reach thorough ripeness, and more than half of the crop has been harvested in the field shown in this photograph. Note how small these Turkish leaves are compared to those in the field of "Virginia" tobacco shown in a preceding illustration.

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that the word "Turkish" as applied to the tobacco of the Orient is something of a misnomer; doubtless one of those misnomers that will never be wholly corrected. Really, this tobacco is grown not only in the present Turkey, but also in the old Turkish provinces—Thrace, Macedonia, Thessaly. After the second Balkan War, in 1913, more than a third of this tobacco producing territory was taken from Turkish control, but there is small chance that the tobacco of Macedonia or its adjacent provinces will ever be called by any but its old name; and, at all events, despite wars and changing territorial divisions, the Turkish tobacco situation is never altered so far as the American cigarette manufacturer, dealer and consumer are concerned. Geographically, at least, we shall continue to get our supplies from the former sources.

*Where the
Turkish
Tobacco
Comes From*

For quite another reason, the term "Egyptian cigarettes" is entirely a misnomer, if the inference is drawn that such cigarettes are made from Egyptian tobacco. There is no such product. In Egypt, the cultivation of tobacco is, in fact, prohibited by law, in order to protect the government's large revenue from the high import duties on raw tobacco.

A great many cigarettes are manufactured in Egypt from Turkish tobacco, and the term might refer to them; but it is likely that the name "Egyptian" is perpetuated mainly because the oval shape in which practically all Turkish cigarettes are now made originated in the land of the Pharaohs.

Here in America, it should also be pointed out, we have on sale two kinds of Turkish (or Egyptian) cigarettes. These are the imported and the domestic. The former are cigarettes made abroad and brought here; the latter are cigarettes made in our own factories from Turkish tobacco. Which is the better sort?

The cigarette is, as we have seen, largely dependent on the taste of the individual smoker, but in this case there are good reasons why the smoker should prefer the domestic brands. One of these reasons is that large capital enables the buying and storage of the cream of the crops year after year.

Another reason is that all the blending of the many varieties of Turkish tobacco is done here, and it is in our country that the art of blending tobacco has reached its best standard.

A third and most important reason is that, when manufactured here, cigarettes reach smokers in the freshest possible condition, with none of the fragrance, the rare aroma that gives distinction to Turkish tobacco, missing.

Tobacco improves in bulk, but dries and loses its excellence when kept a long time in the small, finished cigarette. Of course there are many small Turkish cigarette factories, or shops, for making the hand-made varieties; but it is of the expertly developed cigarette business that I am now speaking. And it is

only in the big factories, where modern scientific methods make it possible to supply with fresh goods the ever increasing demand, that the perfection of the cigarette is really achieved.

I shall never forget my first visit to the fragrant Turkish tobacco rooms in an upper story of the largest factory in New York where all-Turkish cigarettes are made. I had for years been fairly familiar with the methods of harvesting and handling our domestic tobacco and had reveled in the aroma of the choicest grades in warehouses and factories. But I had never dreamed of such a delightful tobacco fragrance as arose from the tons upon tons of Turkish tobacco heaped upon shelves in huge rooms heated like the steam-rooms in Turkish baths—bales of tobacco that had been uncovered and were softening for the preliminary stages of cigarette making.

I imagined all the romance of the Orient rolled into that sweet aroma. Fragrance always fosters joyous thoughts, and here, in concentrated form, was the choicest product of the soil of the land of alabaster and richest perfumes; the most delicate leaves of the finest crops of as many as thirty different varieties of Turkish tobacco. Leaves of the superior quality grown only on the slopes of the hills of Xanthi, rare leaves from the districts of Samsoun, Maden, Dere, Djannik, Baffra and Smyrna in Asia Minor, and the even more

*Concentrated
Fragrance of
Tons of Delicate
Leaves*

coveted Cavalla, Serres, Kir and Zichna leaves of Macedonia.

There is no need further to enumerate all the strange names. Suffice it to say that in this factory, owned by the greatest tobacco organization in the world, are the finest leaves of all grades of Turkish tobacco, raised and manipulated with care unknown in any other part of the world, their purchase made possible by the company's vast resources.

It is quite impossible to comprehend the infinite care, the months of labor which those delicate imported leaves represent.

The largest Turkish tobacco leaves rarely are as large as the smallest American leaves. Most of them are smaller than the human hand, all of them are egg-shaped, or lance-shaped, and tons upon tons of the most delicate of them are no more than two inches wide and three inches long, while thousands in some bales are less than an inch in width and in length. They are as thin as ordinary tissue paper, and it takes several hundred of them on the average, more often thousands, to weigh a pound.

Only when you are told that, in the harvest, each leaf, as it is plucked from the growing tobacco stalk, is threaded with others upon a string will you begin to get a glimpse of the work involved in them.

These strings are worthy a second glance. Once full, they are hung on scaffolds and on the sides of the packhouses and there exposed to a full sweep of balmy air and sunshine of the Orient until the tobacco is cured. The length



COMPARISON OF TURKISH CIGARETTE TOBACCO LEAVES WITH A DOMESTIC LEAF

These parts of bales of very fine Xanthi tobacco show how compactly and with what extreme care Turkish leaves are packed. The center bale is an example of "dubec" packing, famous for the evenness of quality and size of the leaves. Turkish leaves average three and a half inches in length, some being no more than an inch long, and it takes thousands of them to weigh a pound. Note the hole that is in each tiny leaf, made with a needle when gathering, for strings to be drawn through for hanging the leaves up while curing. The large leaf is the average size of the high grade of "bright" Virginia tobacco of the kind from which domestic, and Turkish and domestic blended, cigarettes are made. The illustration gives an idea of the relative size of Turkish and domestic tobacco leaves.

1000
1000

of time depends upon the weather conditions and the nature of the leaves, but after the curing the strings of leaves are kept in the pack-houses until the planter is ready to pack them. Then he takes the tiny leaves from the strings, places them by size one upon another, and so forms a pastal (eighty to one hundred leaves). These pastals are later packed into bales and in that form are shipped to America.

At these harvesting and curing times the buyers representing the great American cigarette manufacturers are at their busiest, locating and buying the best crops. None but men who were either born in the tobacco districts of the Orient, or have become tobacco experts after years of experience among the planters, are intrusted with the purchasing. Much depends on their judgment and skill, and they are chosen accordingly. Under their supervision, at the principal points for the shipment of Turkish tobacco, the American companies maintain great storage warehouses, where their Turkish purchases are packed in jute or goat-hair covered bales, each bale containing the leaves of only one grade.

The labor of packing is infinite, the tiny leaves being again laboriously placed one upon another, and all under the eyes of our fellow-countrymen, for which supervision there is an excellent reason. Formerly, before the large American manufacturers sent their own experts to do this work, they could not be sure of getting good, uniform grades, partly because of the ignor-

*Overcoming
Dishonest
Native
Packing*

ance but mostly because of the dishonesty of the native farmers and middlemen, who packed and shipped all of the tobacco. In fact, to do the work themselves was the only way the manufacturers could be sure of getting what they paid for.

Their advent into the field has made a general advance in honest packing, but small manufacturers still are at the mercy of unscrupulous Orientals who seem to have an inherent desire to deceive. They can easily do this by inserting bad leaves between good ones in the bales, each containing many thousands compactly "nested." It was in order to overcome these wiles of the natives, and to insure evenness and excellence of quality in the tobacco sent here for our cigarettes that our large manufacturers, after spending hundreds of thousands of dollars in futile correctives, hit upon the plan of putting their Oriental work into the hands of Occidentals who were experts in Oriental tobacco.

Once the tobacco has arrived in this country it is kept in bond-storage until needed at the factory. The import duty is thirty-five cents per pound, which, added to the first cost, makes Turkish tobacco among the most expensive in the world, some of the finer commercial grades often reaching three dollars or more a pound, and some special grades being worth much more.

The storage is from two to four years, during which time the tobacco is constantly mellowed and sweetened by natural aging process similar to those described in the

chapter on the storage of domestic leaf. Each bale is labeled with a number indicating the grade of leaves within.

The tobacco is next kept in its bales in the storeroom of the factory until quantities are needed for the special blends that go into the brands of cigarettes which are being manufactured. Then the covering is removed from the bales and, in order to facilitate separation, the tobacco is put upon shelves in a sweat-room, where the leaves become moist and soft, as described earlier.

These leaves are now ready for blending, but, before we proceed with them, it will be well to recall some of the facts about the blending of cigarette tobacco in general. In the first place, it is necessary to blend tobaccos, and to blend them skillfully, in order to produce a cigarette that provides a pleasant smoke. Next, it is absolutely impossible to make a cigarette that will not vary in aroma and smoking quality, unless the blend is made by mixing not two, but a large number of leaves. Third, it is equally impossible to prevent variation unless the ingredients are always maintained in fixed proportions. For these reasons, each brand of cigarette has its own especial formula, which is invariably followed—a formula calling for certain percentages of each of a number of different grades of leaves and of several seasons' crops, and even a variety of sizes of the different leaves.

Now, great as is the care exercised in ciga-

rette tobacco blending in general, the very greatest care is exercised in the blending of the leaves intended for cigarettes of the Turkish variety made in this country. In them indeed the blending is carried to its highest degree of excellence.

Thus, not one bale, but from fifteen to thirty bales of each grade are put on the shelves of the sweat-room, so that when the blenders go for the needed quantity of leaves of that grade, they take a few leaves from each of the fifteen or more bales. That is to guard against any possible variation in the different bales of the same grade. Only the storage and blending of several crops, and of many grades of those crops, make possible a cigarette that, year after year, will burn and taste without variation.

It is clear from this that only the best of expert labor can safely be employed, and, as a matter of fact, the manufacturer's own best interest compels him to employ no other sort. Thus, in a well conducted cigarette factory where Turkish tobacco is used, all of this imported tobacco is handled and blended by natives of the countries from which the leaves come, because the workers of those countries understand their own tobacco better than the workers of other countries. In the Turkish tobacco rooms there are, therefore, often as many as a hundred Orientals working, and seldom fewer than fifty. These workers are

*Turks and
Greeks*

*Employed in
Factories*

the best, at their especial tasks, that their native lands produce. Just as the best talent among opera singers and other professionals is attracted to the United States by our willingness to pay well for the best in the world, so skilled tobacco workers have been attracted to our factories.

It is true that there is comparatively little so-called "Turkish" tobacco imported from Greece proper, but the Greeks are expert in the work of blending, so it happens that there are always a number of Greeks working side by side with Turks. However, political and racial differences are forgotten in the pursuits of industry. The last touch of efficiency is added by the fact that the superintendents over these workers are men that have spent years in the districts from which the tobacco comes.

Formulae must, of course, be kept secret. Therefore, among the workers in this department the manager is the only one who knows the composition of the different brands, or, indeed, for what brand the blend in preparation at a given time is being made. The men simply gather as many pounds or ounces of the different grades as they are told to bring from the steam-room; they remain in complete ignorance of the secret of the formula that gives distinction to the cigarettes which they are making.

But all this while we are delaying the progress of the raw material. From this aromatic paradise the men take the tobacco to the

"pickers' tables." These, of which there are always several, are long, bench-like contrivances at which many men or women sit on either side. They have movable conveyor tops. With nimble fingers the workers pick apart the tiny leaves of the grades of tobacco that they have been familiar with from childhood.

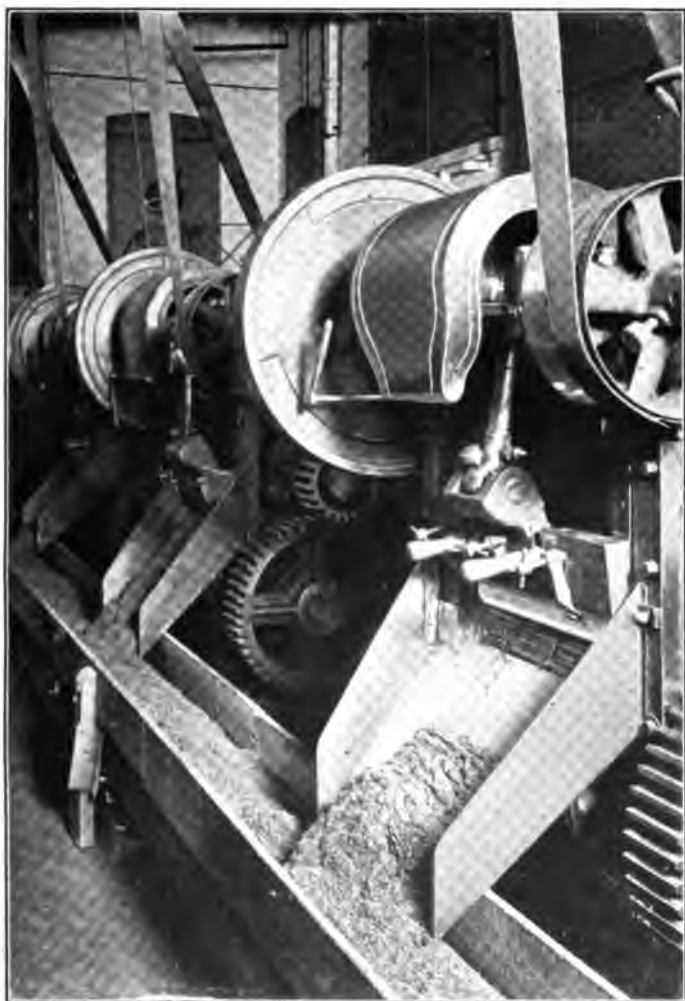
Next, the separated leaves, thus released from years of bondage in the bales, are conveyed by the moving table tops, and by a belt, to a revolving cylinder, through which they flutter in live steam, until at the end they are blown by a blast of air upward into what is called a "cyclone." This is a sort of hopper that releases the air blast at the top while the tobacco leaves drop through the bottom and into trucks.

By the time the leaves travel through the cylinders, cyclones, and tubes they are thoroughly blended, mixed one with another. In the trucks, while they await the actual processes of making the cigarette their fragrance blends further.

For this same purpose the blended crops and grades of domestic tobacco are kept in the trucks for a time. The time for both domestic and Turkish varies from one hour to five hours—in short, until it becomes pliable and uniform in moisture.

It is then ready for cutting, or shredding, into the form in which it is at last to come to the smoker.

This form is determined by the cutting



TOBACCO CUTTING MACHINES

Each of these ponderous machines shreds 5,000 pounds of tobacco a day, the knife in the center, resembling a huge safety-razor blade, cutting the tobacco leaves, pressed into a very compact four-inch cake, at the rate of 300 slices a minute. The large gears shown operate the device for shoving the cake forward and revolve so slowly that the movement is barely perceptible. All gears about which operators work are protected by guards. The shredded tobacco is carried away on the endless belt upon which it falls.



machine, a ponderous device with a keen-edged knife twenty inches wide working vertically. The knife looks like a huge safety-razor blade and apparently is as sharp, for, at the rate of 300 slices a minute, it slashes through a four-inch cake of solidly compressed tobacco leaves. The blade is adjusted to cut the tobacco to the fineness required for any particular brand of cigarette, ranging from forty to sixty cuts to an inch of the tobacco cake. Often there are as many as six, or even more, of these machines slicing away at a tremendous speed, each shredding the tobacco at the rate of 5,000 pounds in a working-day.

*Tobacco
Shredded
at Tremendous Speed*

From below the knife, the shredded tobacco falls upon a belt that conveys it to a steam cylinder drier in which the temperature is about 150 degrees. Coming out of this drier, the shreds pass through a cooling cylinder. The temperature of the beautiful, golden-colored mass as it leaves this cooler is about 110 degrees. It then drops into boxes with wheels under them ("Saratogas" they are called in the factory), each of which holds about 200 pounds. For from twenty-four to forty-eight hours the shredded tobacco is kept in these.

What the manufacturer has now secured is a closely knitted and thoroughly blended mass of the choicest cigarette tobaccos of this country and of the Orient. The object in keeping it again in storage is to let the heat that it contains give it a mellowness

which it would not have if immediately hurried on to the final process. So, after it has been sufficiently mellowed, the product is passed through another revolving cylinder, called the dressing machine, which shakes out all tobacco that may have become matted or formed into lumps, separates and straightens the shredded fibers and puts the whole in the best possible condition for manufacture into cigarettes.

Thoroughly cleaned—in fact, absolutely pure—the tobacco now leaves the dressing cylinders and falls upon wheeled trucks, ready at last for the cigarette making machines. At every stage of its journey it has been handled by tobacco experts trained for years in the United States, Europe or Asia. It is the best quality; it has received the best care.

But we must not delay. The machines are waiting.

CHAPTER V

MAKING THE CIGARETTE

Speed with Which Cigarettes Are Made—Printing the Names—Shaping and Pasting—A "Cigarette-Girl" for Thirty-Seven Years—Factories Are Clean and Healthful—How Cork Tips Are Made—Putting on the Cork Tips—Report by a Pure Food Expert.

THE fragrant leaves that we have traced from their homes in the health-giving districts in our own South, and from the fields of the colorful East—the leaves that we have seen grown with such care and prepared with so much skill—are now about to undergo their final transformation at the hands of the manufacturer. They are about to become cigarettes.

Previous to the invention of the first practical machine for cigarette making, cigarettes were manufactured by the hands of men and women. A great many Greeks and Turks were employed at this work, but gradually nimble-fingered girls predominated in the factories. The average number of cigarettes made per day by each was about 2,500.

Those methods are obsolete. Not only does absolute cleanliness now permeate every phase of cigarette manufacturing; not only are the buildings in which the work is done well ventilated and healthful; but the raw material from the beginning to the end of the process is as carefully protected from con-

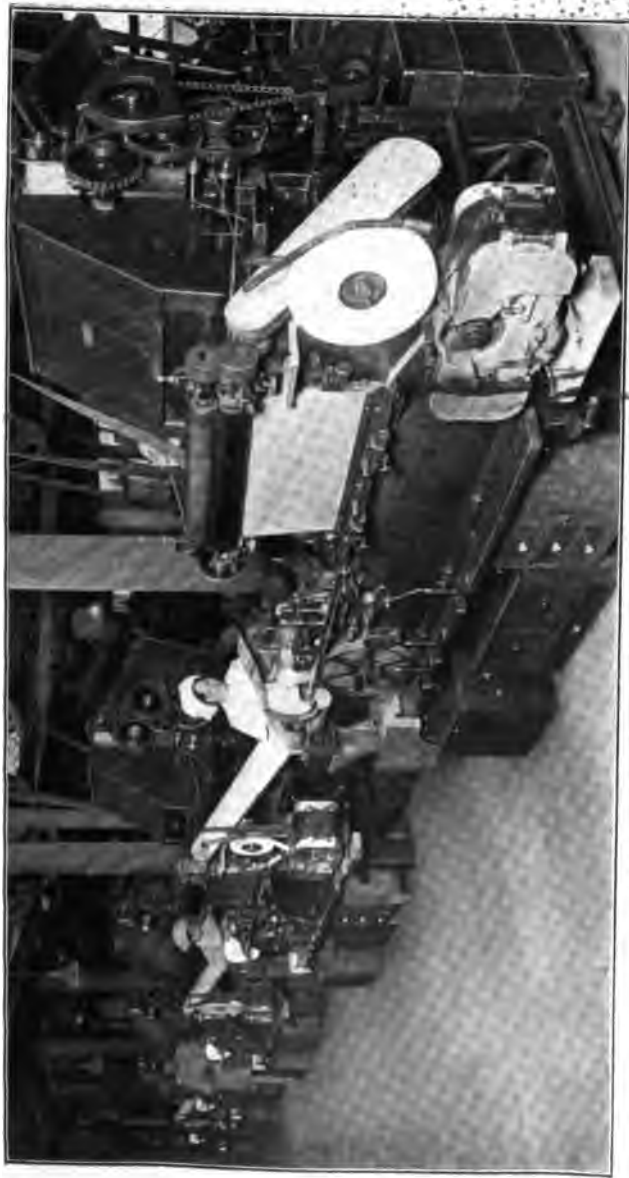
tamination as that in any pure food factory. In fact there is no purer product than the cigarette as made in our big, modern, American factories.

Besides all this we must reckon with twentieth century machinery. Machinery—scientific equipment—has made possible tremendous economies in the cigarette. Machinery has enabled the manufacturers enormously to increase production in order to keep pace with an ever increasing demand; and ingenious inventions have provided means whereby the quality of the output has improved as the quantity has increased. Not only because of developed methods of growth and handling, but also because of perfected machinery, the cigarette smoker is today getting a better smoke at a much lower price than he ever secured before.

Except for the machine by which the type for this book was set and the printing press that printed it, it is doubtful if there is anywhere in the world a swifter or more intricate mechanical device than the cigarette making machine. It is, in fact, two machines in one, for it is a combination of a cigarette forming machine and a two color process printing press.

Imagine one of these mechanical marvels doing the work formerly done by seventy-six hand operators, whizzing away at the rate of 400 finished cigarettes per minute, 190,000 in an ordinary working-day. Then try to visualize a vast factory floor where there are seventy-five of these hum-

*Speed with
Which
Cigarettes
Are Made*



A ROW OF CIGARETTE MAKING MACHINES

Some idea of the size and capacity of a great modern American cigarette factory may be gained when it is known that, while only five machines are shown here, there are seventy more of the same kind on one floor. The capacity of these seventy-five machines is nearly 34,000 cigarettes per minute, and all of them are in operation practically every working-day.

TO THE
LIBRARY OF THE
CONGRESS

ming machines usually all running simultaneously with a capacity of more than 14,000,000 cigarettes in a single day—14,000,000 cigarettes wrapped, labeled with a name printed on each, often in bronze and one other color, all ready for smoking. Mentally picture several of these great busy factories belonging to a single one of the leading cigarette manufacturers. Then you will have some idea of the magnitude and importance of the phase of the great cigarette industry at which we have now arrived, the actual forming of the tobacco and its paper container into the finished cigarette.

We followed the tobacco, in the preceding chapter, through the various blending, reconditioning and shredding processes and left it on the trucks as it came out of the shredding devices in perfect order for entering the machines that make the cigarettes. So delicately has the blending been done, so thoroughly mixed are the many different kinds and grades of leaves, that now when the tobacco is ready to enter the machines it is more than likely that there are, in every very small fraction of an ounce of the filler that it takes to make a cigarette, parts of all the different grades.

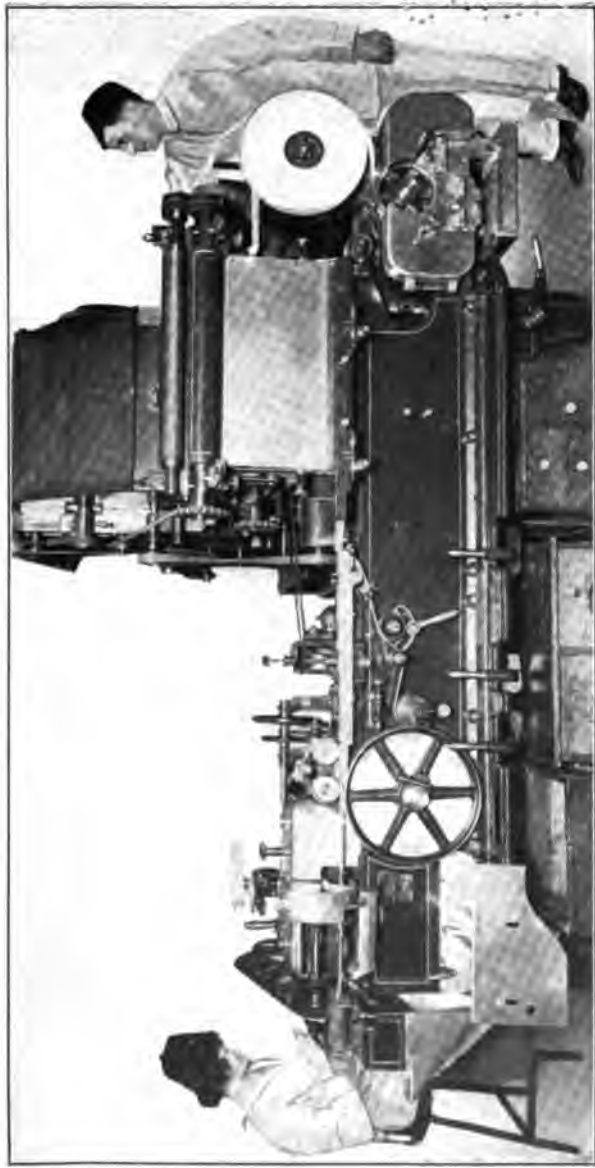
Filled with this fragrant shredded tobacco, the trucks are wheeled to the cigarette making machines and here the tobacco is first fed into a large hopper at the top of each. There are two drums, both revolving in the same direction, from each of which protrude thou-

sands of little curved teeth, the teeth of the lower one being a little longer than those of the upper. The tobacco feeds into a small slit between these two drums and is deposited against metal combs. A "barrel roller," which is a small cylinder with teeth on it, picks the tobacco from between the teeth of the combs and a fan cylinder throws it on a slowly moving wide canvas belt. The tobacco is deposited on this in a flat layer less than half an inch thick. A lever regulating the speed of this carrying belt determines the weight and compactness of the finished product.

Next, another toothed roller, called a "pin-roller," in what is known as the "concave," carries the tobacco from the belt, and a speed-roller throws it rapidly down into a metal hopper from which it is deposited on the cigarette paper that is traveling endlessly beneath. The most characteristic sound of a cigarette factory is the constant thumping of a knocker that every few seconds knocks vigorously against the inside of this hopper on each of the many machines to dislodge any particles of tobacco that may have become attached to the metal, thus preventing clogging of the golden shreds.

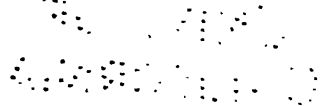
Here must be started the description of another part of this marvelous machine. I must begin with the introduction of the cigarette paper and follow it through to the point where the tobacco falls upon it.

This delicate cigarette paper comes in



FRONT VIEW OF A STANDARD CIGARETTE MAKING MACHINE

The carefully blended and shredded tobacco is put into the big box-like hopper at the back, from which, after a combing process, it is carried in a layer about a half-inch thick by a canvas belt to the metal hopper in front. The tobacco falls to the bottom of this hopper upon the cigarette paper, which feeds into this part of the machine from the large roll at the right after-



strips an inch wide wound in large rolls upon a spool. Each roll contains paper enough for 57,000 cigarettes. The paper is fed over a rubber covered wheel that takes it through the process of printing upon it the name of the cigarette then being manufactured, at just the right spot, so that it will appear on each cigarette.

*Printing
the Names
on Paper
Wrappers*

The printing is done from revolving dies. When the name designs call for a part of the printing in bronze, as do those of three-quarters of the cigarettes on the market today, "sizing" from a series of four wheels is first spread upon the dies for the bronze design and is transferred from the dies to the paper. Then, immediately after this sticky sizing adheres to the paper, bronze dust is flapped on it by revolving velvet daubers.

After this the paper passes to a velvet belt that "sets" the bronze and takes off the waste particles. A revolving brush flicks these particles from the velvet belt and deposits them in a box below, from which they are subsequently taken and used again.

All this while, a little beyond, rollers are inking the dies that will print the second color used in the name design. The paper travels on over these dies, and, as it leaves them, the name in two colors is complete.

Over a roller the paper keeps traveling until it runs under the metal hopper on the machine, where the tobacco drops upon it as described in a preceding paragraph. Now

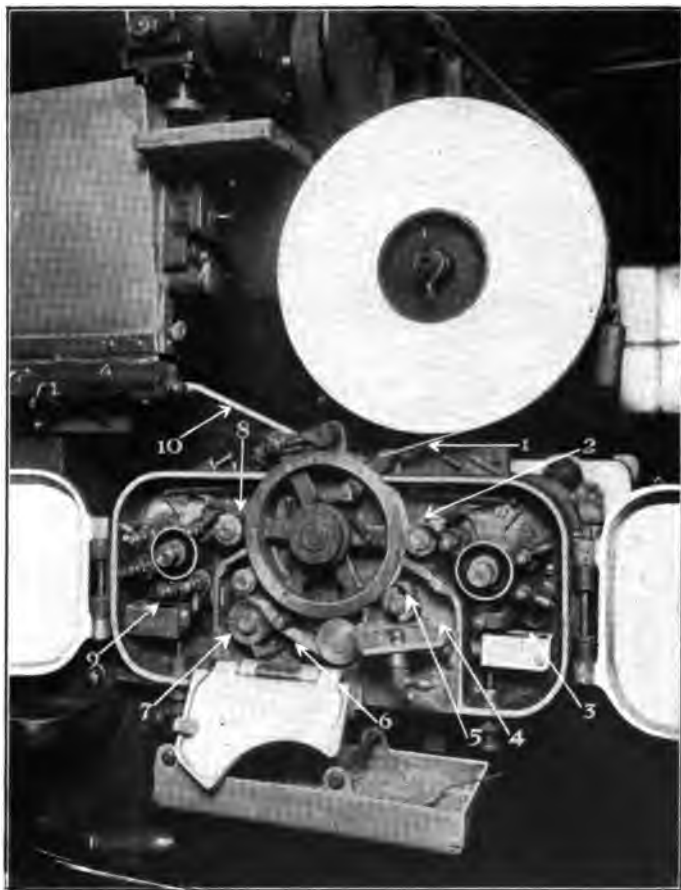
carrying the tobacco with it, it continues on its way.

A few inches farther on, the tobacco laden paper meets and overlays an endless thin canvas belt with which it is carried through a "tongue." This tongue it is that shapes the cigarette. It is a funnel, as wide as the canvas belt at the end where the tobacco, paper and belt enter, but it gradually tapers until, at its far end, it is just the size and form of the cigarette itself.

The canvas belt curves up on either side as it passes through this smooth funnel, and folds the paper around the tobacco so as to leave one edge of the paper protruding to form the flap upon which paste will soon be automatically spread to fasten the paper about the tobacco.

Half a second before the paste comes in contact with the paper, revolving brushes play their part by throwing off any loose particles of tobacco that may be upon the wrapper. Absolutely pure vegetable paste (casein) is used, and, immediately after the brushing, is spread upon the paper from a laterally revolving metal wheel. Directly after this the final folding of the belt and paper as they slip through the smaller end of the "tongue" securely pastes down the protruding flap.

There is another kind of machine that fastens the edges of the paper together by crimping, no paste being used at all. But this is not



PRINTING NAMES ON CIGARETTE PAPERS

By this device the names and monograms, or other designs, are printed in bronze and one other color at a rate of 400 cigarettes a minute from the paper fed from the large roll above. Each roll contains paper enough for 57,000 cigarettes. Following is the process: 1. Paper leaving roll to travel around large wheel in center. 2. Die for putting sizing for bronze design upon paper. 3. Cup for sizing which is carried to die on a series of rollers. 4. Cup for holding bronze. 5. Velvet daubers which flap bronze upon the sizing as the paper travels around wheel. 6. Endless velvet belt which "sets" the bronze and removes superfluous particles. 7. Brush for removing superfluous bronze from belt. 8. Die for printing name of cigarette in design. 9. Cup for holding ink which is carried to die on rollers. 10. Printed cigarette paper emerging from printing device and entering cigarette forming machine. Only one side of the printer is used when the design is all in bronze or in only one color.

[illegible]

in general use except in the making of the Russian style of cigarettes with mouthpieces on them, and these are manufactured in comparatively small quantities in the United States.

To return, however, to the typical machine and the work that it is doing: The canvas belt, emerging from the "tongue," unfolds and descends over wheels that carry it endlessly around, while the "cigarette rod"—the name given to the long pasted paper filled with tobacco—proceeds straight onward into a brass funnel that enters a "ledger plate," through the middle of which is a hole just the size of the cigarette. As it leaves the "ledger plate" it encounters a six-inch, keen-edged, circular knife turning at a speed of 4,000 revolutions a minute.

This buzzing knife cuts the "cigarette rod" into the lengths desired for the different cigarettes, each length being regulated by gears that control the speed of the knife carriage. It is one of the most carefully looked after parts of the machine—that knife. Always it and its fellows must be kept in first-class condition, and for this purpose every factory has a grinding room where hundreds of the blades are being constantly ground on a series of emery wheels. When, from its place in the machine, it has done its work of cutting, the long process is nearly at an end. Divided into their destined lengths, the cigarettes move on to a

*Cigarettes
Cut by Swift
Circular
Knives*

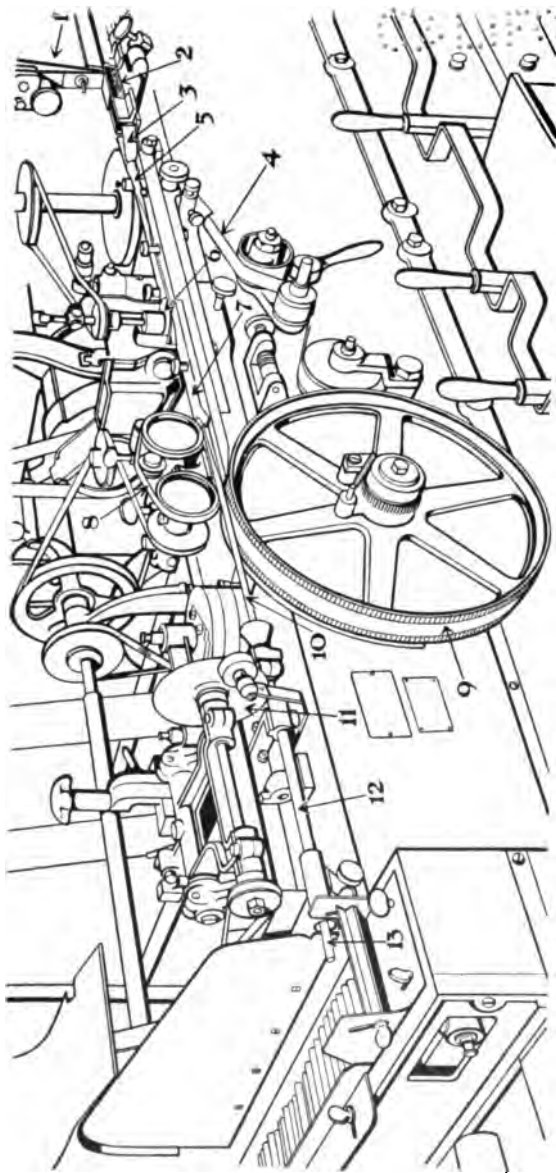
belt called the "cigarette catcher," which deposits them on a stationary flat surface.

Save in the case of the cork tipped brands, the cigarette is now complete, and a single machine, aided by one girl and a mechanic who looks after several machines, has made it so, at the rate of 400 cigarettes per minute.

This cigarette making machine demands more care than a thoroughbred horse. Especially is it necessary to guard against the percolation of any infinitesimal bit of oil into the tobacco, and so well is that guard now exercised that this annoyance, which in the early days of the machine-made cigarettes was a serious matter, has now been at last entirely eliminated.

Frequently, in those pioneer times, a small amount of oil carelessly allowed to get into the tobacco from some portion of the machine would ruin large quantities, for, in smoking, the pungent taste of oil, which is decidedly disagreeable, was quickly detected and made the cigarettes unmarketable. The riddance of the possibility of such an accident in these days is one of the triumphs of modern cigarette manufacture.

And now one word more about that wonderful cigarette making machine. Because it is the source of great economy, doing the work once performed by about seventy-six hand-workers, you must not, however, conclude that this almost human mechanism has thrown out of employment the once familiar "cigarette-girl." On the contrary, the ever



SCALE DRAWING OF THE PART OF THE MACHINE THAT FORMS THE CIGARETTE.

1. Hopper down which the tobacco falls upon the paper.
2. Tobacco carried upon paper into the cigarette forming device.
3. Funnel which begins curving the paper around the tobacco.
4. Endless canvas belt which meets the paper and runs under it, curving it firmly around the tobacco as it goes through the "tongue" (5) leaving an edge of the paper protruding as it emerges.
6. Wheel which spreads paste upon the protruding edge, or flap, of paper.
7. Slate with groove the shape of cigarette flap.
9. Endless belt going around wheel after flattening upon leaving groove.
8. Belt-sealer, which gives final pressure to the funnel.
11. Circular knife which cuts the "cigarette rod" into individual cigarettes.
10. "Cigarette rod" plunging on into after being cut.
13. Finished cigarette emerging.
12. Tube through which cigarettes travel

1. *What is the purpose of the study?*
 2. *What are the research questions or hypotheses?*
 3. *What is the study design?*
 4. *What are the variables?*
 5. *What are the data sources?*
 6. *What are the data collection methods?*
 7. *What are the data analysis methods?*
 8. *What are the results?*
 9. *What are the conclusions?*
 10. *What are the limitations?*
 11. *What are the implications?*
 12. *What are the future research directions?*

increasing production of cigarettes has made places for an increasing number of girls in the factories year after year, and there have always been a great many more girls employed in one department or another since machinery took the place of hand work than there were before.

More than this, I have never seen a healthier, happier looking body of factory girls than those in the employ of the big cigarette factories that I have visited. In one I talked to a woman who has been a "cigarette-girl" for thirty-seven years. She has been in the same factory since the days when practically all cigarettes were made by hand and was first a hand operator. She became a machine operator, and is now one of the forewomen in the factory in question. I found numbers of other "cigarette-girls" who had been in the factories from twenty to thirty-five years.

These frequent instances of long service surely allay any suspicion that there is anything injurious to health in the constant association with tobacco. The foreman of the factory in which I found the woman with a record of thirty-seven years, said that never in his long experience had he known of a case where the work injured the health of an employee. My own observation leads me to believe that, far from being injurious, the tobacco odor is beneficial.

Scrupulous cleanliness characterizes, more-

over, all of the different processes in the manufacturing of cigarettes. There is a free circulation of fresh air through the rooms of the factories, also a remarkable absence of the tobacco dust that one might expect to find where tons of finely shredded tobacco are always being carried from one process to another.

Finally, in the modern factory, the neat personal appearance of the employees reflects their surroundings. They are clean, they wear specially designed "bungalow" aprons, and on their heads they wear neat caps which completely cover their hair.

I have said that the introduction of machinery into this industry produces more cigarettes and better ones. It also makes for uniformity of quality. In this respect it accomplishes what human hands cannot, however skillful they may be. It does that, and it insures the absolute cleanliness of the finished product.

During the making of the cigarette, from the time the tobacco enters the cutting machines through to the final process, the tobacco never once comes in contact with the operator's hands.

The first human touch that the cigarette receives comes only now that the machine has finished its labors, and that touch is of the lightest. Almost as rapidly as the great mechanism deposits cigarettes from the "cigarette catcher," a girl who is also called a "cigarette catcher," gathers them and puts

them into trays. This girl is the first inspector of the finished product. Although the cigarettes are flying out at the average rate of 400 per minute, she deftly picks out the few imperfect ones and drops them into a hopper at the side of the machine, which carries them away. These cigarettes are simply the ones that are either too full of tobacco or not full enough, or others from which the paper may have been torn. None of these ever gets past the inspector.

We have already mentioned the cork-tipped variety and have said that, save where such tip is demanded, the cigarette left the cigarette making machine a finished article, ready for the smoker. But, as a matter of fact, from a third to a half of the different brands on the market have cork tips. These must undergo another process after leaving the machine.

Recently, when his business had to make another move uptown, a prominent New York retail merchant remarked that "in order to remain stationary in New York, one must keep moving." In much the same manner, it may be said that, now we have reached the detail of the cork tips, this story of the cigarette, in order to progress, must go backward. We must see where the cork comes from, and we must study its manufacture before we can get an adequate idea of the magnitude of the process of cork tipping.

Most of the world's cork supply comes, as

is generally known, from southern Europe and northern Africa. It is the outer bark of the cork oak. A majority of the large factories that convert the bark of the cork trees into commercial products are in Spain and Germany. Thus it happens that most of the cork-sheets from which cigarette tips are made are imported from these countries. Lately factories in the United States have, with considerable success, begun making cork sheets on a comparatively small scale, and the indications are that our machinists will be able to perfect the process to such an extent that, no matter what may happen to the industry because of protracted wars in Europe, there will be no shortage in our supply.

Now, just as the cigarette paper itself is the perfect, most delicate product of the paper-maker's art, so these cork sheets, that are used exclusively for tipping cigarettes, are the most perfect, most delicate product of the cork manipulator's art. Only the fine bark from the lower branches of cork trees fifty or more years old is of the high quality demanded for cigarette tips.

First the cork is cut into blocks about the size of an ordinary hand blotter, about four and one-quarter inches wide by from six to ten inches long. Razor-edged knives, or planes, shave from these blocks filmy layers which are as gauzy as the finest tissue paper, and no thicker. Some idea of the thinness of these

cork sheets may be gathered from the fact that, to make a pile only one inch in height, three hundred and fifty sheets are required.

In the same manner in which an ordinary package of envelopes is held together by a paper band, these sheets are bound together by a strip of paper around the middle. There are from 200 to 250 sheets in each bundle, and it is in these individual packages that the sheets are received at the cigarette factories in the United States.

It is estimated that the world's annual consumption of cork tips equals a quarter of a billion square feet of pure cork sheets, and this is an article of commerce that has come into use solely because of the cigarette industry.

The fragile sheets are backed with fine tissue-paper in the cigarette factories. This is called maize paper, because of its corn color, which is practically the color of the cork. It comes in rolls and is five inches wide, or about three-quarters of an inch wider than the cork-sheets. The rolls are ten inches in diameter and when it is said that one of these small rolls contains enough paper to back the cork for 384,000 cigarette tips, some idea of the thinness of the paper may be gained, together with a hint of the perfection of utility which the manufacturer has learned.

Girls do the work of backing the cork-sheets. They operate machines that carry the paper over a smooth board surface and, as it passes them, the workers deftly spread the sheets of cork upon it. The cork is attached

by "sizing applied to the paper from rollers just before it emerges upon the board. The rapidity and skill developed by these girls in applying the cork sheets and joining them exactly end to end as the paper is continuously rolling before them is marvelous. The backed sheets are wound upon a roller at the further end of the machine as they leave the operator's board.

Now the paper backed cork sheets have to be cut into strips the width of the cork tip as it is found on the finished cigarette. The machine that performs this task is called the slitting machine. By keen-edged knives each roll is slit into eight strips a half-inch in width. These strips are wound at high speed upon spools into rolls about seven inches in diameter. They are then ready for the cork-tipping process and are taken to the "tipping" room as needed. Meanwhile they are kept in chambers where the humidity of the atmosphere is under control, so that the cork will not dry out but will remain firm and in the best possible condition for the use to which it is about to be put.

Remember that the cigarettes are now leaving the cigarette making machine. After inspecting them, the girl "catcher" puts the perfect ones into trays, every one of which holds 1,200. These in turn are loaded on wheeled trucks, each holding sixty-three trays, and are wheeled either to the packing department, or first, when the cigarettes require tips, to the cork-tipping room.

We now come to the tipping machine, an-

other of the wonderfully intricate mechanical devices that American ingenuity has added to this enormous industry. Here again the operator is a girl. According to her expertness and the type of machine she operates, she can tip from eighty-five to one hundred and twenty-six cigarettes per minute. The girls who operate these cork tipping machines are responsible for the cleanliness and perfect condition in which they are kept, and the care they take of them is characteristic of the care exercised in every department of a modern cigarette factory.

*Machines
That Put
on the
Cork Tips*

Among the various types of tipping machines, that known as the "suction" machine is the one that has been longest in use. In this the cigarettes are put into a brass hopper, from which they drop upon an endless steel chain with a large number of grooves and are carried along by the chain to their ultimate destination.

On a reel on the top of the machine, one of the rolls of cork strips has been placed, and the cork as it leaves the reel feeds over a metal wheel with a knurled surface from which pure vegetable paste is spread upon the paper backing. The cork journeys to a knife that cuts it to the needed length for the tip of one cigarette. Just as the cork is severed, a gripper seizes it and drops it over a suction box. This is a curved piece of metal perforated with small holes through which air is constantly drawn by a suction-pump. The suction draws the cork firmly down upon the

metal, and it is at this point that one end of the cigarette, traveling in its groove on the endless steel chain, is plunged out upon the tiny bit of cork. A revolving brush laps first one side of the cork and then the other over the cigarette and pastes it firmly upon the cigarette paper. The cork is cut long enough to leave a small flap, and the last operation of the brush pastes this flap down, binding the tip together. At the completion of this delicate operation, the cigarette is thrown back into its groove on the endless chain by means of another plunger.

So rapidly is all this done that the eye is too slow to catch the sight of it. The endless chain carries the tipped cigarette on until it meets a small velvet belt running above the steel belt and this velvet smooths out the pasted cork tip. The cigarettes drop into hoppers, and are again put into trays holding 1,200 each and taken to the packing-room.

There has been put into many factories a more recently invented tipping machine which pastes the tips upon the cigarettes without the use of suction. The cork tips, after the paste is applied, are here carried to the cigarette around which they are to be pasted, by two small steel rods. These rods, as they go flying back and forth, remind one of the rapid antennae of a hungry grasshopper eagerly devouring food.

There is, I should like to submit, a certain poetic justice in this resemblance. You will recall what I said in Chapter I about the word "cigarette" coming, through the French,



THE CORK TIPPING DEPARTMENT

The machines shown in these two photographs are of the latest standard type that are supplanting the "suction" machines described in this chapter. In the top picture note how the strip of cork, as thin as tissue paper, feeds from the spool at the top into the center of the machine. A knife cuts it the desired length, paste is applied, two clawlike rods seize the cork tip, bring it forward and paste it around the end of the cigarette as it travels in a groove in an endless metal belt at the rate of about two cigarettes per second. The bottom picture shows the fronts of the machines. The untipped cigarettes feed from a metal hopper into the grooves in the belt. The operator in the foreground sees that all the name designs on the paper wrappers are turned upward so that the pasted flaps on the cork tips will be uniformly on one side of the cigarettes. In trays of 1200 the tipped cigarettes are carried to the packing-room. Stools or chairs are provided for all employees who wish to sit while working.

ALPHACON

from the Spanish word "*cigarral*."* That word means "garden," but, long before it meant "garden," its root meant only "grasshopper". It was because, in the Spain of the Middle Ages, grasshoppers were always found in larger number in gardens than anywhere else, that those gardens were at last called "*cigarrales*," meaning the places where grasshoppers were most abundant. A machine that reminds one of a grasshopper has, therefore, a philological, as well as an industrial reason for its place in a cigarette factory.

Whatever sort of tipping machine is used, however, the girl who operates it must begin to clean it as soon as it is idle. For this she is provided with a compressed-air tube, with which she blows out every particle of tobacco dust that may have gathered. Every portion of the shining metal is thoroughly cleaned and polished once each week, and the same scrupulous care is taken of all the machinery used in the various departments.

Fearing that some readers may think me unduly enthusiastic about the cleanliness of modern cigarette factories I am going to take the liberty of quoting from an article by Alfred W. McCann, published in the *New York Globe and Commercial Advertiser*. Those who have followed Mr. McCann's investigations and writings on pure food matters know that his integrity is beyond question. His pure food reports and impure

*Report by
a Pure
Food
Expert*

*Cf. the French *cigale*.

food exposés have attracted nation-wide attention and have given great impetus to the national crusade for pure foods and sanitary manufacturing conditions.

He visited and made a thorough inspection of a factory in West Twenty-seventh Street, New York, where some of the most famous brands of Turkish tobacco cigarettes are made. Following are three paragraphs in his article describing what he saw and giving his deductions:

The food factory exhibitions which it has been my unhappy lot to witness, make me want to cry out to the whole food world, "Go and see for yourself what your factories ought to be. Learn to smoke cigarettes if it will help you to get at the truth. But do anything that will get you in touch with an object lesson so expressive of common decency that you will go back home ashamed and kick up a reform."

Everywhere you find in this cigarette factory evidences of refinement which, alas, should not stop there. White walls and ceilings, floors as clean as freshly chiseled marble, cutting machines that seem to say, "We were made for the preparation of food, but somehow got sidetracked and find ourselves cutting Turkish tobacco," wrapping machines that take away from the human hand all detail and leave nothing to human supervision but the watchfulness of trained eyes, contribute to a poem of sanitation themes that are found, alas! too rarely where humanity has a right to look for them.

I urge health commissioners, food inspectors, sanitary experts, and disciples of common decency to visit the factory and see what can be accomplished where men are willing to look upon cleanliness as something little short of godliness.*

*New York Globe and Commercial Advertiser. Issue of February 4, 1916.

CHAPTER VI

PACKAGES AND PACKING

Evolution of the Sealed Package—Machine Prints 25,000
Bands per Hour—Ingenious Cup-forming Devices—
Wrapping Cigarettes in Foil—Picture Inserts—Care
Taken to Protect Products—Pioneers in
Sanitary Package Goods System.

WHEN so much care has been taken, and when so much money has been spent upon the conversion of the tobacco into cigarette form, it is not to be supposed that the manufacturer spares any pains to insure the cigarette's progress to the retailer—and so to the ultimate consumer—in the best possible condition. Nor are any such pains spared.

Consequently, in dealing with packages and packing, this chapter treats of two of the most important developments in modern industrial history: the application of efficiency methods to mechanical and human labor in the handling of materials, and the supplanting of wasteful and insanitary ways of packing and marketing with the economical and sanitary sealed package system.

Especially in respect to the containers of their manufactured materials, cigarette manufacturers were pioneers in these matters of efficiency and have remained among the leaders.

Package making was a crude affair in the early days of the manufacture of cigarettes, which were then mere rough-and-ready paper

tubes filled with tobacco. Those were the days when we were just graduating from the era of the home factory and the wayside water-wheel mill; when products of the soil were made ready for use either in the home or by being hauled in bulk to mill or factory, again hauled away in bulk, and sold by the retailer in bulk.

The history of the individual paper container is practically coincidental with the history of the modern cigarette, and that goes back over a span of less than half a century.

The year 1850 had come and gone before a container for retailing bulk material meant more than a cloth or paper bag, and it was a long time before the mind of man could grasp the idea of its being more than one simple evolution of that paper bag—a one-piece paper container flapped over at the top.

When cigarettes were packed in such manner waste resulted, because the tobacco, with nothing but thin paper around it and practically exposed at the top, quickly dried and worked out of the cigarettes and, when it was being carried about, out of the loosely made container and into the pocket of the smoker.

Wrapping the individual bundles of cigarettes in foil before inserting in the container was the first great step forward in packing. This helped to keep the cigarette in good condition, but did little toward eliminating waste, and nothing at all toward increasing convenience.

It remained for the next evolution to revolutionize the cigarette business and to do it practically overnight. This was accomplished by the introduction of what is known as the "shell and slide" box.

Little do we, who daily see many of this sort of handy boxes used for all sorts of goods, think of the stride in merchandising made by that simple invention. At last a man's mind had grasped the idea that a container could be more than a mere one-piece bag; that it could be one box within another—a container made so that it would slide into a shell, or another slightly larger container. The slide of this improved cigarette box had a flap that folded over the cigarettes. The foil wrapper was retained.

Here at last was a box that not only kept the goods in perfect condition, but was at once a great convenience and an eliminator of waste. The handiness of it converted tobacco users by the legion. They had held aloof from the cigarette for several reasons; but it is now a question whether their chief objection to the cigarette did not lie in the faulty packing about which I have just written. Certainly there was now an almost immediate jump from millions to billions in the annual sale of cigarettes in the United States.

That was a boom time. It is on record that the largest manufacturer of popular priced cigarettes, for several years after the introduction of the "shell and slide" box, never caught up with his orders, despite the fact

that he constantly put in new machines and enlarged his plant as rapidly as his conservatism would permit. He did not believe, and often said so, that the ever increasing demand could last. If it had not been for his timidity, his output might have been many times multiplied. He retired when he reached fifty years of age. He had amassed a fortune of millions, yet the belief was forced upon his associates that, had he taken full advantage of the opportunities he possessed by being the manufacturer of the most popular brands on the market, he would have built up one of the largest personal fortunes in the history of our country.

That, however, is getting ahead of our story. We must forget high finance and think, rather, of the more sordid routine of the cigarette factory's packing-rooms.

Let us look first at the making of the boxes into which the cigarettes are to be packed. The manufacture and printing of the ornately labeled shells, and what are known as the "cups" which now are used as the containers for the "twenty in a package" cigarettes, are done in large establishments outside of the cigarette factories *per se*. For the most part they are printed in New York and Chicago, Rochester (N. Y.), Richmond, and New Haven.

They are sent to the factories in packages of sizes meeting the requirements of the packing machines on which they are to be used. They are not only printed, but are scored and

cut so that they will bend into the form in which they will ultimately be used.

The large cigarette factories now make and print their own slides, as well as the bands that are pasted around the cigarette packages. The slides are cut from large pieces of cardboard, printed and scored for bending, all on a single machine, coming out in long strips ready for the packing machines.

The machine that prints the bands is really a high speed, two color printing press. The narrow strips of paper which are wound into rolls on spools are automatically fed over type-dies revolving on a rapidly whirling wheel which prints the bands in two colors at the rate of 25,000 per hour. As they reappear, these long strips of printed bands are again wound upon spools, later to be pasted around the cigarette boxes. This is done either by hand or, more often, by machinery.

*A Machine
That Prints
25,000 Bands
Per Hour*

Oval cigarettes are packed into their boxes by hand, and this shape includes all Turkish and so-called "Egyptian" cigarettes—mostly all the cork-tipped cigarettes on the market.

No machine has yet been invented that will do the work economically, and every attempted invention has failed for the reason that the oval shape does not lend itself to rolling. That this is a passing difficulty seems certain, however. With machinery now accomplishing most of what was formerly done by hand labor, and accomplishing it better, it is safe to say that it will not be long before

practical machines for this process will have been perfected.

Be this as it may, the happy looking girls that sit at the long tables in the well ventilated rooms packing these oval cigarettes seem to be doing their work at a satisfactory rate. Six hundred cigarettes are placed before them on tables, and the shells and slides, or hinge boxes as the case may be, are brought to them in separate bundles or cartons.

Each girl handles and inspects the cigarettes separately, throwing out any that are imperfect. She puts the perfect ones into the slides or boxes in the requisite number, rolls them so that the monograms or labels will be facing upward, folds the slide together if it is a "shell and slide" container she is filling, shoves the filled slide into the shell and folds down the flap, completing the package. A good packer does this easily at the rate of 300 boxes of ten each—3,000 cigarettes—every hour.

On the other hand, since they are easily rolled, round cigarettes of the popular kinds that constitute the vast majority of the annual American output are packed by machinery which does the work with many times the speed with which it can be performed by hand.

A large proportion of these are now put up in packages of twenty, which retail for ten or fifteen cents, and the making of these packages and filling them has developed some of the most ingenious machinery of which our factories can boast.



PACKING THE MORE EXPENSIVE GRADES OF OVAL TURKISH CIGARETTES BY HAND

At the rate of 3,000 per hour each girl inspects the cigarettes, places them in the boxes, rolls them so the monograms or names will be uniformly upward, folds the coverings neatly, closes the boxes and puts them into cartons. All women workers in cigarette factories are paid either entirely by piece-work, or by a minimum wage plus premiums based on piece-work. The "cigarette girls" who find employment the year round are among the best compensated women wage earners in the United States; and, working in well ventilated, clean rooms, are among the happiest and healthiest.

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"Cups" is the term by which the outside containers are known to the trade. As has been noted, the sheets of paper from which they are made come to the factories cut to size, scored and ready printed. There they first go to the cup-forming machines, which are operated by girls. Each machine can turn out 23,000 cups in an ordinary working-day.

*Ingenious
Cup-
Forming
Devices*

A receptacle filled with pure paste kept at the right degree of heat by an electric stove underneath, is on one side of the machine. Rollers revolve through this mass of paste, and from them the paste is taken up on the soles of two metal "feet" that fly back and forth like a shuttle. On the way back from the rollers, the "feet" plunge down upon the inner, unprinted side of one of the sheets of cup paper, which sticks to them and is lifted to one of four revolving cup-forms on the machine. The paste from the "feet" adheres to the edge of the paper which, as the "feet" fly back for another sheet, is grasped by a "finger," which wraps it around the cup-form, pasting the paper together lengthwise.

This cup-form travels upward automatically for a quarter of a revolution, and there stops for a moment, while four clawlike pieces of steel fold one end of the paper together two ways. Another quarter-revolution brings it to a steel presser which presses the folds firmly down and seals this end, forming the bottom of the cup. Turning another quarter-revolution, now pointing directly

downward, two claws slide the completed cup from the mould, which then moves on to the point where the "feet" carry another sheet of cup paper upon it. So the process keeps on hour after hour.

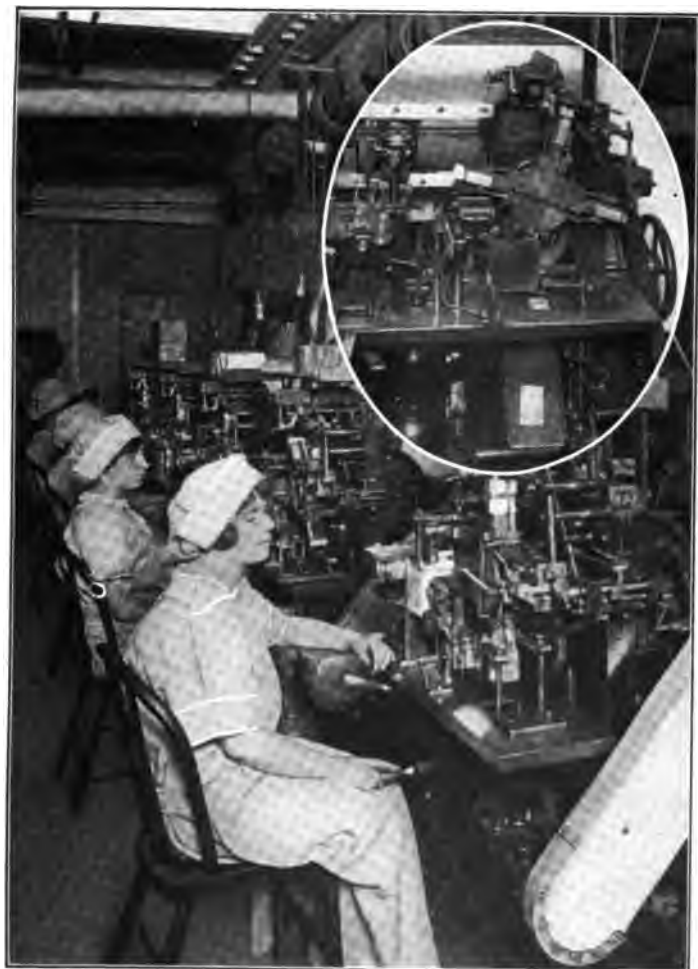
Every movement of the machine is made by an intricate series of cams. Nowhere in the entire contrivance is there a single gear or pulley.

Just below the ceiling of the room on the floor underneath the one in which are these cup-forming machines is a long trough. As the cups slide off the machines, they drop through into this trough, in the bottom of which are doors. Through these doors the cups, automatically shoved along the trough, drop into large wire receptacles above the machines that insert the cigarettes in them.

As they are brought to one of these filling machines, the cigarettes are put into a hopper holding about 2,500. From this they roll down an incline. At the same instant, from underneath the machine, paper-backed foil is fed from a roll nine inches in diameter, containing, when full, eighteen pounds of foil.

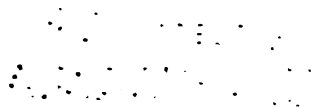
On a laterally revolving metal disk are eight box-like containers open at the top. A knife plunging upward cuts off a piece of the foil to the length required for the wrapping of twenty cigarettes, and this falls on one of the containers while the disk stops for a fraction of a second. In that fraction of a second the twenty cigarettes are released at the foot of the incline by three

*Wrapping
the
Cigarettes
in Foil*



FORMING THE "CUPS" IN WHICH THE TWENTY-IN-A-PACKAGE CIGARETTES ARE PACKED

This is one of the most intricate machines developed in the cigarette industry, each machine, operated by a girl, forming 23,000 cups per day. At the top is a close view of the part of the machine that forms and pastes the ends of the cups, as described in the opposite and following pages.



distinct openings of a trap, the first freeing seven cigarettes, the second seven and the third six. These fall on the foil in three layers, and the cigarettes, with the foil beneath them, are pressed down into the container.

Now the disk starts moving again. Swiftly a girl who sits beside it places on the cigarettes any inserts that are to go into the package. The container whirls past her until it reaches a squeezing arrangement that presses against the sides of the bundle and at the same time presses the cigarettes down, giving the finished form to the package. A little farther on, an ironing contrivance folds the foil over the top of the cigarettes, and, still farther along, two separate processes fold the foil over the ends.

Now comes the last process. A clawlike carrier removes the completed foil package from the container and carries it to a point where it meets a plunger, which forces it into one of the labeled paper cups that has been loosed from the big wire hopper above.

Is all this dry in the reading and slow in the telling? If so, it fails sadly to envisage the actuality. In the real event, the movement is sufficiently swift and exciting to interest anyone fortunate enough to witness it. Each machine has a capacity for packing 36,000 cigarettes an hour, and the average output, allowing for delays of all kinds, is 15,000 packages, or 300,000 cigarettes every day.

Nor do the human helpers lag so far behind. As the packages come from the machine, they fall on a moving belt and go to tables,

where girls seal them with colored paper bands. So expert are these girls in this work that two of them, with the help of another—who divides her time between two machines—can seal the daily output of each machine: the entire 15,000 packages.

Similar in operation to this machine just described is that which packs the ten round cigarettes into the highly popular five-cent boxes. There is only one important point of difference. This lies in the fact that the latter machine, in addition to packing the cigarettes, makes, from long strips of pasteboard fed from a roll, the slides into which the cigarettes are packed.

In two layers of five each, the cigarettes are deposited upon the foil, and the foil is squeezed, or "locked" (as they call this operation in the factory), immediately. The foil-covered bundle, which is carried on a revolving metal disk, is then plunged into the slide, and this in turn, by another swift operation, is plunged into the shell. The flap is automatically folded over the cigarettes, and a traveling belt brings out the completed package.

Here again enters the inspector. She is a girl operator with keen vision, who overlooks the foil packages as they pass before her on the metal disk and, detecting any flaw, deftly picks the defective package from its container and throws it aside. At all stages of the manufacture, indeed, the operators act as inspectors, and there is no chance of any but perfect products leaving the factories. The



FILLING TWENTY-CIGARETTES-IN-A-PACKAGE "CUPS"

The cups fall into the large wire hoppers, shown in these two views, from the cup-forming machines on the floor above. From the metal hopper at the right of each filling machine the cigarettes roll down upon tinfoil that is fed in below, first two rows of seven cigarettes and then a row of six. A revolving metal disk carries them along in forms. As they pass before her the operator inserts coupons, then ingenious devices fold the foil over the cigarettes above and at the ends, compress them and plunge the foil packages into the cups, which in turn are folded at the ends, and the completed packages emerge upon a carrier belt. Each machine has a capacity of 15,000 packages, or 300,000 cigarettes per day.

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filled boxes shoot out of each of these machines at the rate of 2,280 an hour.

For the past thirty or forty years "picture inserts"—that is, pictures inserted in the box—have from time to time been a distinguishing feature of the five - cents - a - box cigarettes. These pictures are of many sorts, often good portraits of professional baseball players, et cetera, and in many cases they are pictures of real educational value.

*Picture
Inserts of
Educational
Value*

In fact it is the general practice now for the large manufacturers to try to make of these inserts real educational forces. Among them are pictures of the flags of nations in their correct colors, views of cities and public buildings, battleships, the uniforms of army and navy officers of the different nations, also in correct colors; and the corporation that manufactures the oldest and largest selling of all the brands has, ever since the beginning of the great European conflict, been giving to the purchasers of these five-cent cigarettes authentic pictures in three and four colors of scenes of the great war, each of which is intended to be instructive, and which, as a series, are intended to make a complete running pictorial history of the war.

The printing of these inserts is done on contract by big color printing concerns outside the factories and is in itself a tremendous industry, annually producing hundreds of millions of these little cards.

After the packing machines have done their

work, the cups and boxes are taken to another department where the bands are pasted upon them, and finally the United States internal revenue stamps are attached. These stamps come in perforated sheets of a hundred each.

Now the preparations are made for shipment to the retailer. The packages are put into cartons of various sizes and each carton is wrapped by hand in moisture-proof and germ-proof glassine paper and firmly sealed. These cartons are wheeled on trucks to the shipping department, where they are packed into wooden or paper-board boxes and then are ready to forward to every quarter of the globe.

One might suppose that here at last the vigilance of the big producer comes to an end.

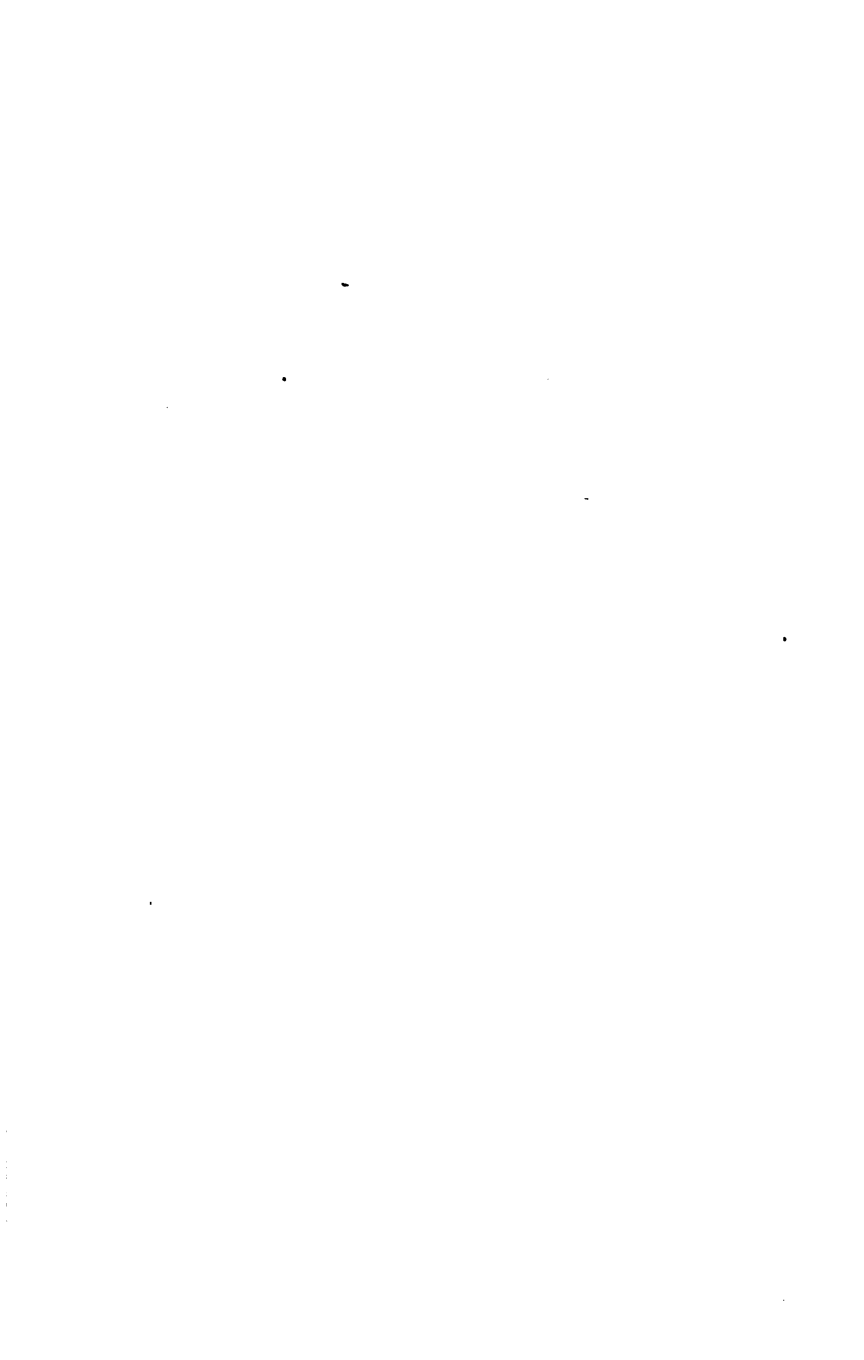
**Great Care
Taken to
Protect
Products** Not at all. On the contrary, it is the practice of the largest cigarette manufacturing corporation, whose methods were studied, to make of its salesmen permanent inspectors, and to send them regularly over their routes to look frequently at the goods on the retailers' shelves and make sure that they are always fresh and in good condition.

In preceding chapters I have noted the great susceptibility of tobacco to climatic and atmospheric conditions, and this sensitiveness characterizes it in its manufactured state also. The need of educating retailers in proper methods of keeping cigarettes so that their quality will not be impaired will be understood when that characteristic is remembered.



PUTTING ON BANDS AND PACKING BOXES OF CIGARETTES INTO CARTONS

This work, like all of the other work performed by girls in the making and packing of cigarettes, is done in scrupulously clean, well ventilated rooms. Every precaution is taken not only to manufacture the product amid sanitary surroundings, but to protect it after it leaves the factory and until it reaches the consumer. In their individual packages two or more thicknesses of paper, and usually tinfoil, protect the cigarettes. Then the containers are packed in cartons which are sealed, and these in turn are wrapped and sealed in dust and moisture proof glassine paper.



There remains the question of wages. All of the employees in the various departments of the factories, the machine operators, cork-tippers, packers, inserters, sealers, stampers, et cetera, are paid either entirely by piece-work, or by minimum wages plus premiums based on piece-work. Their pay-checks prove that the many thousands of "cigarette girls" who find employment the year round are among the best compensated wage earners in the vast army of working women in the United States; and when the factories are running full time, as they usually are in these days of phenomenal cigarette consumption, the more expert among them make unusual incomes. The making or handling of a thousand cigarettes is the unit upon which all compensation is based.

Now, to all this, what is the relation of the consumer? In the first place, it is a very close and vital one. Because of the care with which cigarettes are packed, the consumer really deals directly with the producer. He buys the goods in their original package, the tobacco never having been touched by anyone from the beginning of the process of manufacture, through the packing and shipping, until the cigarettes are taken from their container by the fingers of the person who is to smoke them.

In fact, it is my opinion, based on knowledge extending over many years of investigation of manufacturing and retailing, that cigarettes may be classed as about the purest of

*Pioneers in
Sanitary
Package
Goods System*

pure food products. Their manufacturers, besides being pioneers in the package goods system, have always in this respect kept ahead of the times.

Cigarettes in dust-proof and mould-proof foil containers inside of paper slides and shells securely fastened by bands—cigarettes put into cartons so that no impurity could possibly reach them during transit or handling—such cigarettes were on the shelves of the general stores many years before the proprietors of those stores stopped scooping loose bulk crackers from a barrel where they absorbed the impurities of a dust- and breath-laden atmosphere. They were there before the store-keeper had stopped chasing the sleepy cat from its bed in the bag of dried peaches in order to perform his function of retailer. And they were there in the days when coffee was scooped from open bags with a scoop borrowed from the sticky, open, brown-sugar barrel, into scales reeking with the remains of the salt-pork or dripping salt-fish that had been weighed on them five minutes previously.

Tobacco retailing has, moreover, become specialized in recent years. Now the cigarette shelves of the retail tobacconist are as neat and inviting as the pantry and preserve shelves of your grandmother. They are quite that, and they are ten times as radiant because of their neat, multi-colored and gilded labels.

Anybody that has studied American food industries—excellent as those industries are—and has then investigated the large ciga-

rette factories of this country, will admit the equality in purity of the cigarette. No cereal breakfast foods, no confections, no crackers nor biscuits are today packed with more care and more protection of their purity, than are cigarettes.

Consider again the make-up of an ordinary cigarette package. First there is the cigarette paper around the tobacco, which is the ingredient that it is the object to protect, with all of its sweetness, aroma and good smoking quality preserved. Then there is the foil, itself backed with paper, wrapped around the cigarettes and folded over their ends at both top and bottom. Added to this is the pasteboard slide with its flap folding over the top, which in turn is put into the pasteboard shell and then sealed with a band. Then the individual packages are put into heavier pasteboard cartons and these are encased in the dust, germ, mould and moisture-defying glassine paper. It is obvious that the smoker must be buying cigarettes that are in an impregnable condition.

Millions of dollars of added expense is what all this has meant to the manufacturer. But if for no other reason than to render his profit-earning permanent in a competitive field, he has always been looking toward a pure product ideal, and has willingly stood the cost involved. Therefore, it was not enough for the manufacturer that his cigarettes should be made in sanitary factories and shipped from them in perfect condition. He saw to it that they reached the consumers in just as good con-

dition. He did not propose that they should deteriorate in transit, or by being unprotected in the retailer's store, or that there should be waste anywhere along the line, which would result in the ultimate purchaser not getting all that he paid for.

He made his wares sound articles of commerce—just so many in every package, to be sold in the original container at a uniform price, and every grain of the tobacco to remain in each cigarette until taken from the package by the smoker.

More than that, on every package of his cigarettes the manufacturer puts his label in the form of a trademark, a brand and the designation of the factory at which the cigarettes are made. There is nothing anonymous about them. The jobber and the retailer are merely agents. It is the producer who makes himself directly responsible to the consumer.

That concern which markets an advertised article of commerce put up in a labeled package may not rashly risk its reputation and good will by taking chances with goods of inferior quality or of short weight. It has too much at stake.

The large cigarette manufacturer spends millions of dollars a year to bring his product to the high state of perfection reached by American cigarettes. In the carefully sealed package he at once protects the consumer and the reputation of his jealously guarded brand and trademark. His label on the sealed package is his guaranty of the contents.

It has been, as I have said, an expensive

course. Manufacturers without large capital could not have afforded it; but the big cigarette manufacturer could afford nothing less, and results have justified his actions. His every step forward to his ideal of a pure product has invariably been followed by increased sales.

CHAPTER VII

CIGARETTE PAPER

Purity of Ingredients of Cigarette Paper—Making Cigarette Paper a Real Art—Absolute Cleanliness Is a Necessity.

AUTHOR'S NOTE.—The information in this chapter was furnished by Thomas J. Keenan, F. C. S., Editor of *Paper*, who is an authority on all kinds of paper and their manufacture.

IN writing a book upon a subject that is more or less in debate, it is always well for the author to consider the attitude of mind likely to be assumed by persons whose opinions are at variance with his own. Conscious of the wisdom of this counsel, I can well imagine what, if he perseveres so far, the opponent of the cigarette will be inclined to say at this point of our narrative. It would be, I imagine, something like this:

“This is all very well. You have told us everything that there is to tell about the science of growing tobacco and much about the art of transforming it into the cigarette. But in your accounts of the latter particular you have omitted one most important detail. You have shown us that, at tremendous cost and with scrupulous care, the cigarette is a pure product; but, although you have told of the harvesting, curing, ordering, storing, blending, manufacture and packing—although you have given us the facts about printing and rolling—you have said nothing about the one thing that, in the last analysis,

differentiates a cigarette from a cigar: you have failed to tell us of the nature of the paper employed, and I contend that the paper in a cigarette is one of the elements that make this article of commerce dangerous."

Well, such a critic does not stand alone. It must be freely admitted that he has plenty of company. Only a short time since, a prominent inventor, himself a user of tobacco, but not in cigarette form, made a statement that seemed to place him beside our imaginary commentator. He asserted that cigarette paper when burned gave off harmful acrolein vapors.

As a matter of fact, however, this *obiter dictum* merely made cellulose and paper chemists smile. Their denial of the statement was prompt and vigorous, and it was evident that this critic had spoken at random.

Acrolein is an aldehyde producible only in the burning of fatty substances, generally animal fats, that have as a part of their content a glyceride, whereas cigarette paper is wholly a vegetable product without glyceride or other fatty compound.

Any chemist will tell you that cellulose fiber is the substance that forms the basis of a sheet of ordinary paper, and that it is perhaps the purest form of a natural product extant. In chemical constitution it is a form of starch and differs in no respect from the material which under that name is fed to babies, or which is stored in seeds, fruits, and stems for the nourishment of plants and gives them their food value.

Do papers vary in their chemical properties? Of course they do. Just as the starches of commerce are found to vary according to their sources from which they are derived—whether from potato, arrow-root, tapioca, rice, corn, wheat or barley—so do commercial papers vary according to their derivation.

The ordinary wrapping papers of heavy weight and coarse in texture and appearance stand at perhaps the lowest point of a range extending therefrom through many familiar kinds of paper made by the matting together of cellulose fibers obtained from various materials. All of them, however, are of vegetable origin, derived either from the stems of cereal plants, the seeds of cotton, the tissues of flax and hemp, the whole stems and leaves of straws and grasses, sugar cane, bamboo and the various kinds of soft woods such as spruce, hemlock, poplar and cottonwood.

But cigarette paper stands, with the purer forms of the filtering paper used by chemists, at the other end of the range of papers which begin with that coarse brown product employed in the stores for wrapping up parcels. Like filter paper, cigarette paper is almost pure cellulose.

Anybody that will take the trouble to investigate may readily see for himself that

Purity of Paper Ingredients	only pure flax or linen fiber, hemp fiber and ramie fiber are admissible in the manufacture of cigarette paper. He may— he must—see for himself that even the <i>selection</i> of these is deemed of great
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importance in the production of a paper which will grade up to the standard insisted upon by makers of high grade cigarettes. The utilitarian reasons are sufficient. These manufacturers must themselves meet a demand for a paper that will insure the burning of the tobacco it contains, that is of itself free-burning and that is yet so devoid of any flavor of its own as not in any way to affect the sensitive flavor and aroma of the burning tobacco.

Now, as already noted, the vegetable fibers that are endowed with these qualities of perfect tastelessness and freedom from odor are few, and the production of a good cigarette paper from them is a difficult process, beyond the capacity of the general paper manufacturer. He, indeed, regards special tissues of this kind with the same wonder that is elicited from the layman who knows nothing whatever about the intricacies and manufacturing secrets of paper making. A specialist is necessary. For the making of cigarette paper is a highly specialized branch of the broad industry of paper making.

The paper used for all grades of their product by the large American manufacturers is of a sort that cannot yet be produced at home in either the desired quality or quantity. Even the "rice-paper" that was in former times the boast of the high grade cigarette, if not wholly a thing of the past, is at least employed only in small quantities. Modern methods have developed more satisfactory ingredients.

Because of the nature of these ingredients,

the chief centers of the cigarette paper industry are now in France, Austria, Germany and Italy—here mentioned in the order of their importance as regards cigarette paper production—and the business is pursued almost exclusively in European countries.

It has to be carried on close to large sources of the spinning wastes of linen manufacture. In addition to a plentiful supply of the raw material, one of the prime requisites in the conduct of this specialty is an abundant supply of the purest spring water for bleaching and washing purposes.

When we come to study in detail the requirements of manufacture, it will be easy to understand why the industry has never made much headway in the United States.

In the first place, there are generations of experience behind the products of the European cigarette paper mills. The real art of the cigarette paper maker begins with the correct combination of the cooked pulps that form the basis of the finished sheet of thin paper, which varies in opacity and soft silkiness of texture according to brand.

As it often happens that orders will be received at a cigarette paper mill for exactly the same quality that a customer purchased fifteen or twenty years earlier, and as such an order is likely to be accompanied by the stipulation that "the slightest deviation in the interior or exterior qualities of the paper will result in the rejection of the goods," even a

layman will grant that the attention which must be paid to the selection of quantities and qualities of raw material in the initial stages of manufacture is most exacting.

In selecting his raw material, the manufacturer remembers that the ideal basis for cigarette paper consists of housekeeping linens spun and woven at home by the rustic population of flax-growing countries, particularly in the eastern part of the Austro-Hungarian monarchy, where chloride of lime as a bleaching agent is unknown and where the fibers of these linen textiles have retained their softness, flexibility and integrity of length and strength unimpaired by chemicals.

Besides the home spinners, the linen spinning and weaving mills contribute their share of waste for conversion into paper pulp, and this must be strong and of good quality, owing to the stress and usage that the thin paper produced from it must withstand, either in rolling by hand from the small package sheets, or in the production of tubes from endless sheets, to be filled with shredded tobacco on the machines used in wholesale manufacture.

It is needless to say that, for hygienic reasons, if not as a matter of nicety in taste, only new or unworn material may enter into a cigarette paper, and even the new fiber substances must be perfectly clean. For the same reasons, absolute cleanliness in all stages of the process of manufacture is a *conditio sine qua non*.

Not to go into a too deeply technical de-

scription of the process of manufacture, it may at once be said that, after sorting
Absolute and cutting, the material for
Cleanliness cigarette paper is thoroughly
Is a dusted by machinery, after
Necessity which it is boiled and washed,
 and again boiled, this time in a solution of soda
 under pressure.

Different papers, of course, require various pulps boiled according to different processes, the object sought for in a freely combustible paper, such as cigarette paper, being a fiber which combines great porosity with a loose, spongy consistence.

Thus the boiling process determines the quality of the many varieties of cigarette papers, and it is only the maker of these papers, working with a limited quantity of fiber, who can decide the effect of this or that kind of digestion, with half an atmosphere of pressure more or less, or an increase or decrease of soda, or maybe the effect of lengthening or diminishing the boiling period.

Another washing follows the boiling, and the extent to which this is carried on can best be understood from the fact that for each paper machine almost 300 gallons of clean water per minute must be provided.

The well washed pulp is then beaten to a condition that reduces it to "half-stuff," a technical term for a mass of pulp that has been ground and teased by being made to circulate in water in a big oval-shaped tub under blunt revolving knives that almost touch a stationary bed of blunt knife blades. When

the pulp has been sufficiently disintegrated in this way, it is further diluted with water and screened to remove any lumps or knots that may have escaped the process of beating.

There follows a bleaching, which takes about twenty-four hours before the desired whiteness of material is obtained. A further washing ensues to remove all traces of the chemicals used in bleaching, and then the pulp is drained and stored away for several weeks to ripen.

It is, however, with the final utilization of these pulps that have been stored for ripening, that the true craftsmanship of the cigarette paper manufacturer is brought into play. The mixture of ripened pulps for a cigarette paper often consists of ten or twelve kinds, depending upon the variety of paper to be made. The manufacturer's field of choice is wide, and now his success depends upon the way in which that choice is exercised.

*Mixture
of
Ripened
Pulps*

The decision is made; the manufacturer fixes on a combination of pulps that will produce the kind of paper desired, and then the whole-stuff-beating engine is charged with the mixture. Here the mass is again beaten and ground under revolving dull-bladed, knife-like projections for from six to eight hours for thick, soft and porous combustible paper, and from sixty to eighty hours for thin, highly translucent paper.

After determining, by samples taken at different levels in the tub, that the fibers have been thoroughly softened and adequately

teased to show well ramified fiber ends, the material is transferred to a mixing-tub. Here water is added to bring the milky suspension of fibers to the proper consistence, or enough to form a sheet of only two or three superimposed fiber layers.

Now the paper-sheet must be formed, and to effect this the thin, milk-like suspension of fibers is pumped up to a long, oblong box elevated above the paper machine, and is further screened and filtered in its passage to remove any knotted fibers. From the oblong box it trickles over "slices" exactly parallel to an endless band of copper gauze, called a Fourdrinier wire, which, in addition to a swift forward motion, has a regular reciprocating side movement.

On this wire the evolution of a sheet of paper can be clearly witnessed. A film begins to form half way down the wire as the pulp proceeds on its swift passage to the first couch roll, where the delicate web, of gossamer fineness, is transferred from the wire with great care. The thin tissue of paper can scarcely be detected on the wet felt where it is caught on its passage from the wire.

Then the paper is led under and over drying cylinders heated internally by steam. It is next either carried upon filagree calenders where artificial watermarks are impressed by means of engraved steel rollers under high pressure, or else it is led to a cross-cutting machine that divides it into the requisite shape or length.

That, briefly but exactly, is the whole story of how cellulose fibers are transformed into cigarette paper. It should be convincing proof of the purity and harmlessness of the product, and it should clear our way for a glance at another side of the cigarette industry that reads like a fairy tale.

CHAPTER VIII

GROWTH OF THE INDUSTRY

Remarkable Development, Now Reaching an Annual Production of Over 16,000,000,000 Cigarettes—Nearly 500% Increase in Last Fifteen Years—Growth Due to Quality of Tobacco Used—Statistics on the Volume of Business.

SO ROMANTIC is the history of the cigarette industry's growth that, were it not borne out by the cold figures of Governmental reports, the average reader would be justified in doubting its authenticity. The leaps that it has made—leaps upward that have never been followed by an appreciable decline—would, if translated into human action, fit only the career of the impossible hero of an impossible novel. What the unconquerable D'Artagnan is to the fiction of adventure, the cigarette is to the fact of business.

We people of the United States smoke 45,005,715 cigarettes on each of the three hundred and sixty-five days of the year. Half a century ago we smoked none, or practically none, the rare few in use then being of the expensive Russian mouthpiece variety. But they were a wholly inconsiderable item in tobacco affairs.

Looking backward from the present situation to those early days, we see that, in the fiscal year of 1869, when the paper-covered cigarettes of the sort so common today were first classified by the Government for internal revenue purposes, there were manufactured

Number of cigarettes on which the internal revenue tax was paid during the fiscal years from 1869 to 1914, inclusive, and the amounts of such tax received by the Government.

Year	Number	Receipts (Dollars)
1869	1,750,000	3,273
1870	13,890,000	21,426
1871	18,930,000	28,605
1872	20,691,000	31,082
1873	27,087,000	40,658
1874	28,717,000	43,695
1875	41,297,000	65,443
1876	77,420,000	135,485
1877	149,069,000	261,818
1878	165,189,000	289,081
1879	238,276,000	416,981
1880	408,708,000	715,269
1881	567,386,000	992,981
1882	554,543,000	972,570
1883	640,019,000	929,974
1884	908,090,000	454,419
1885	1,058,748,000	529,535
1886	1,310,960,000	655,569
1887	1,584,504,000	792,279
1888	1,862,726,000	931,363
1889	2,151,515,000	1,075,830
1890	2,233,254,000	1,116,727
1891	2,684,538,000	1,342,269
1892	2,892,982,000	1,446,491
1893	3,176,698,000	1,588,361
1894	3,183,582,000	1,592,412
1895	3,328,476,000	1,666,923
1896	4,043,798,000	2,025,417
1897	4,153,251,000	2,080,583
1898	3,753,695,000	3,599,705
1899	2,805,130,000	4,213,215
1900	2,639,899,000	3,969,191
1901	2,277,069,000	3,427,043
1902	2,651,617,000	2,687,139
1903	3,041,572,000	3,038,061
1904	3,235,102,000	3,228,599
1905	3,376,632,000	3,346,560
1906	3,792,758,000	3,737,431
1907	5,167,021,000	5,163,233
1908	5,402,336,000	5,403,998
1909	6,105,255,000	6,126,243
1910	7,874,239,000	8,558,854
1911	9,244,351,000	11,617,621
1912	11,239,535,000	14,091,513
1913	14,294,895,000	17,911,211
1914	16,427,086,000	20,574,791

only 1,750,000 cigarettes, on which the makers paid a tax of but \$3,273.

In 1874, after the business had received a fair start, we smoked 28,717,000, upon which a tax of \$43,695 was paid, while forty years afterward, in 1914, the business had grown to such an extent that we smoked in that year 16,427,086,000 and the sum paid to the Government in 1914 for internal revenue tax by manufacturers of cigarettes was \$20,574,791.89.

These striking facts epitomize the remarkable growth of the cigarette business in this country. It is one of the greatest industrial developments the world has ever known, and, as it is a case where figures are more eloquent than words, it is best elaborated in the accompanying table, which gives, year by year, the story of cigarette progress in the number of cigarettes manufactured and the amount of internal revenue tax paid on them from the earliest Government records to the close of 1914.

It is worth while to look at these figures carefully. By them you will see that in the latest year for which the totals are available, 1914, the number of cigarettes manufactured was 2,132,191,000 more than in the preceding year. In the past four years the product was doubled, with 678,608,000 to spare. Year after year the number made and sold has increased by leaps and bounds of billions, the growth in the last six years being about 200 per cent.; and in the fifteen years from 1899 it has been from 2,805,-

*Nearly 500%
Increase in
the Last Fif-
teen Years*

130,000 to 16,427,086,000, or nearly 500 per cent.

Does this mean only an increase in the number of smokers? While we are dealing with figures it is interesting to note that the increase of 2,132,191,000 cigarettes in 1914 over the total for 1913 is equivalent to an increase of 5,841,619 per day. If this were due entirely to new smokers and their average consumption were ten cigarettes in each twenty-four hours, it would mean that cigarette smokers in the United States are growing in numbers at the rate of a little more than 584,000 per year, or 1,600 daily.

Now, while the demand for cigarettes has increased in this phenomenal manner, it is a significant fact that the number of cigars smoked, and the amount of chewing and smoking tobacco and of snuff consumed, remained about stationary. The cigar consumption even shows a slight decrease and the other three varieties, classified under the head of "manufactured tobacco," show only a small growth. In 1913 we manufactured 8,732,815,000 cigars and cheroots as against 8,707,625,000 in 1914. The figures on manufactured tobacco show, for 1913, a total of 437,572,088 pounds as against 445,271,954 pounds the next year.

To what cause are we justly to assign this tremendous increase in the consumption of cigarettes?

There is one reason advanced from the side of the manufacturer as his part in the growth of the industry, although he well realizes that the other and more fundamental reasons rest

with the smoking public's appreciation of the intrinsic value of his wares. This purely trade-reason was recently expressed as follows in one of the manufacturers' trade journals, "The Tobacco Leaf":

In the opinion of this paper the remarkable increase in the cigarette output is simply a question of business enterprise. The cigarette manufacturers have done things in a big way. They have willingly expended large sums of money without expecting or demanding an immediate return. They have done this not in a gambling spirit, but after having actually and calmly mapped out a logical business campaign and having followed it through to its conclusion. In other words, the cigarette business has had a punch behind it.

The cigarette manufacturers have been optimists. They have refused to permit temporary business depression to interfere with their business aims and purposes. When conditions were bright and prosperous they advertised heavily; when conditions were bad and the future foreboding they advertised more heavily. The cigarette division is about the only division of the tobacco industry that is thoroughly awakened to the fact that advertising is more necessary in bad times than in good times.*

In these times no American is likely to deny the value of advertising, nor will any observant person be inclined to dispute the statement that the advertising of the cigarette has helped its sale. But it is a well-known fact that no amount of the cleverest advertising and business enterprise will keep up a demand for an inferior article, and that, although advertising works daily miracles, even the clever advertising of our great cigarette manufacturers, while it has undoubtedly immensely in-

**The Tobacco Leaf*. Issue of April 30, 1914.

creased sales, is yet incapable of being the chief cause of this marvelous growth in the consumption of cigarettes.

Fundamentally, the leading secret of that growth must obviously be that, once the cigarette industry really began, millions of Americans very speedily became convinced that cigarettes were best for them; or, to put it in another way, they have realized that cigarettes are the most pleasing and the mildest form of tobacco enjoyment.

*Growth Due
to Quality
of Tobacco
Used*

Back of that reason is the fact that the very best tobacco grown in the United States and in the Orient is used in the manufacture of cigarettes. It is mild tobacco. There is undeniably a general public tendency toward the use of milder tobacco, and, in the cigarette, men get this in an economical and convenient form—the short smoke that is peculiarly adaptable to the temperment of the American people in an age when things are done hurriedly and yet with greater efficiency than at any previous time.

No consumer knows quite so well what he wants as does the smoker. If the tobacco put into cigarettes were not of superior quality and if, having once used them, men were not convinced that cigarettes are the ideal form in which to use tobacco, it stands to reason that the sale of cigarettes would instantly decline.

The effect which the ever increasing popularity of the cigarette has had on the tobacco business as a whole is evident the moment we look back upon that business. As was stated

in the first chapter of this book, the greatest increases in the tobacco market have always been coincident with increases in cigarette production. You will remember the small beginnings of the industry as previously narrated. Today the only crops in the United States that are richer than the tobacco crop are those of corn, wheat, cotton, hay, oats and potatoes. Owing chiefly to the cigarette, tobacco is our seventh largest agricultural product.

Two and three-quarter inches is the average length of a cigarette, yet, placed end to end, the annual output of cigarettes would extend far enough to make a single strand bridge from the earth to the moon, around the moon five times, back to the earth and around the equator about four times with a few hundreds of miles to spare.

Statistics on the Volume of Business With that same output, you might lay a cigarette cable twenty-eight and a half times around the equator and again have a few hundreds of miles left over. And if you prefer to visualize this vast quantity of cigarettes in bulk, just consider that, in 1914, there were 25,667 tons of tobacco manufactured into cigarettes.

These figures are reflected in the federal ledgers. The total amount of money received by our Government from the internal revenue tax on all kinds of tobacco products during 1914 was \$79,986,639.68. This does not take into account import duties and revenue from taxes of other kinds which amount to many



HIGH GRADE TURKISH TOBACCO IN A NATIVE "MAGAZINE"

This typical storage warehouse is in Cavalla, which was one of the leading seaports of Turkey in Europe until after the second Balkan war in 1913, when it became a part of Greece. In these warehouses the bales are kept from one to three years, mellowing with age. Then they are sent to bonded warehouses in the United States for storage until the tobacco is needed by cigarette manufacturers. It takes a man from four to six weeks to pack a bale, and during the years in storage each bale is frequently turned over so that the tobacco will mature uniformly, and the cords around them are tightened almost weekly, so that the tobacco as it dries will remain closely packed.

millions more. We are dealing simply with the internal revenue tax imposed on manufacturers. Yet the sum mentioned means that the tobacco manufacturers paid more than a fifth of the total Government receipts from internal revenue; it means that they paid nearly three-fifths of the entire cost of the United States Navy in 1914, or nearly half of all our pensions; and the manufacturers of cigarettes alone, through their portion of this tax, paid a sum nearly as large as the interest on the public debt. In that one year, the cigarette tax paid more than five times the total expenses of the Pension Bureau and agencies in disbursing the Government's pensions.

One more comparison is instructive. The estimated retail price of cigarettes in America during 1914 is \$123,203,145. An estimate of the retail price of tea and coffee consumed in this country during the same year is about \$259,000,000. This means that the American people as a whole spent about \$136,000,000 more for the solace and comfort in tea and coffee than for the sort of enjoyment and satisfaction derived from cigarettes. But cigarettes are growing in favor at an unprecedented rate.

There are still persons—though they are not persons with a knowledge of cigarette facts—who declare that this growth is a source of danger to the physique of the American. We have already touched upon one or two of their pretensions. It is now high time to regard them in detail and to begin with a study of the chemistry of the cigarette.

CHAPTER IX

CHEMISTRY OF THE CIGARETTE

**What Noted Scientists Find—Convincing Report Made by
Ohio Chemist—London *Lancet's* Analysis—
Reports of Other Reputable Chemists.**

IN THE world of commerce there is a legion of cigarettes, but in the world of controversy there are but two brands: There is the cigarette that science has seen and tested and upon which it has reported favorably, and there is the cigarette that the anti-cigarette crusader thinks he sees and finds wholly irredeemable.

The crusader—let us set it down to his credit—has a way of saying things that, even if rarely resulting in changing laws or the habits of a nation, at least do get heard.

It is safe to assume that no reader of these pages is unfamiliar with the anti-cigarette man's accusations. He is sure that the cigarette is filled with terrible drugs; he is certain that it contains the germs of many an awful disease; he feels confident—at times he seems almost to hope—that in its curling smoke there lurk the unavoidable seeds of death.

What, on the contrary, has been discovered in the cigarette by science in the person of the unprejudiced and clear-headed chemist?

Nothing but pure tobacco and the purest product of the paper-maker's art.

Analyses of dozens of brands of cigarettes have been made by the score in the official laboratories of national and state govern-

ments and universities, both in Europe and the United States, yet always the chemical experts who did the work have been unanimous in their verdict, and always the verdict has been the same. These are men of the highest ability, men at the head of their profession, and they have one and all agreed that the cigarette is nothing but about one-twentieth of an ounce of the highest quality of tobacco enveloped in a $1 \times 2\frac{3}{4}$ -inch piece of pure paper weighing one seven-hundredth of an ounce.

That is all. That and nothing more. No added ingredients: no opium, no morphine, no arsenic.

Of course it is at any time easy to prove that to introduce such ingredients would be an impossibility from the manufacturer's standpoint, and equally of course the charge has been disproved so often that it ought to be unnecessary to pay any attention to it here. The stock argument used in attacks on cigarettes always has consisted, and still continues to consist, of the mere allegation that the cigarettes do contain drugs; for some obscure reason the pseudo-reformers seem loath to drop the fiction, and so the tottering argument is daily and persistently reiterated.

Ohio is one of the states where the poison-rash most recently broke out on the body politic, and there it produced at least one beneficial result—beneficial to the cigarette, its manufacturers and the peace of mind of its consumers. The Dairy and Food Division of the Agricultural Commis-

*Convincing
Report
Made by Ohio
Chemist*

sion of Ohio took the matter up, with the result that the Bureau of Drugs of that great state has made one of the most thorough examinations of cigarettes ever attempted, and has issued an exhaustive official report that should forever lay the ghost of this cigarette drug fiction.

Dr. Azor Thurston, department chemist, is the man that conducted the analyses, which were of twenty-six popular brands of cigarettes. His report is preceded by an announcement by W. R. Hower, chief drug inspector of the Bureau of Drugs, in which he thus tells of the origin and object of the investigation:

This Department in the course of its regular narcotic work and in the investigation of narcotic sales invariably found quantities of the cheaper brands of cigarettes with the opium outfits and abundant evidence that large quantities of the cigarettes were consumed with the opium. The constant association of the use of cigarettes with narcotics and especially with the opium and cocaine habits, led to a more thorough investigation along this line with the result that the Drug Bureau called the attention of Hon. S. E. Strode, Commissioner in Charge of the Dairy and Food Division of the Agricultural Commission, to the conditions found. He immediately ordered a complete and full investigation and analysis of the various brands of cigarettes on sale in this state. The object was to determine if possible the cause for the so-called cigarette habit and to determine what substances if any were added to the cigarettes.

Reports had reached the bureau that manufacturers of cigarettes and cheap cigars were buying large quantities of tincture opium, but this the bureau was unable to verify.

Thereupon Inspector Hower records that, after a study of Dr. Thurston's report, his Bureau has drawn the conclusions: that "no added medicinal substances of a narcotic nature were found in the tobacco"; that "the tobacco products were found to be slightly lower in nicotine than the average leaf-tobacco"; that the paper wrappers of the cigarettes "were found to be treated with the carbonates and oxides of calcium, aluminum and magnesium, added probably to regulate the burning qualities" and all perfectly harmless. He also concluded that any evil effects of habitual cigarette smoking "must be attributed to the inhalation of the smoke or the products of combustion rather than to any added narcotic in either the tobacco or the papers." The portions of Dr. Thurston's report that relate to the filling material in the cigarettes follow:

*No Added
Narcotic
Of Any
Nature*

Some six months ago while in conversation with Hon. S. E. Strode, Commissioner in Charge of the Dairy and Food Division of Ohio, the question of adulteration of cigarettes and other tobacco products came up and the statement was made, by some one present, that large quantities of tincture of opium were being purchased by manufacturers of this line of goods. An investigation was therefore ordered, not only as to opium, but as to medicinal substances in general. It fell to the lot of the writer to make whatever investigation was deemed necessary.

The most natural thing to do was to look up the literature on the subject and to my surprise I was unable to find a published account of the analysis of

cigarettes or cigars, although other tobacco products were fairly covered in reference to nicotine and some other constants. I therefore wrote to the Bureau of Chemistry, U. S. Department of Agriculture, where one naturally expects to obtain methods of analysis of practically everything, and again I was doomed to disappointment; the reply indicated that methods had not been developed for making analyses of cigarettes, although the department had made a few examinations of cigarettes with the view of determining whether or not they contained opium or arsenic.

I found in Wiley's Agricultural Analysis a statement in reference to opium and cigarettes as follows:

"It is believed, however, that opium is not often found in manufactured tobacco, and it has never been found in this laboratory in cigarettes, although all the standard brands have been examined for it."

I at once took the matter up with Dr. Wiley by correspondence and received a reply as follows:

"As far as I know, opium, arsenic, etc., have never been found in cigarettes. This is a rumor which is constantly being floated, but is without general foundation. The cigarettes are harmful enough in themselves without seeking this extreme evil in them. None of the results referred to were ever published as far as I know. You can, perhaps, get more definite information concerning this investigation from Mr. McElroy himself as he is a practicing chemical patent attorney in this city. The address is K. P. McElroy, 918 F Street. I have no special data on the subject of the cigarette evil, but am unalterably opposed to the use of tobacco in any form, as I consider it an unclean, unhealthy habit which diminishes the vitality and the efficiency of the user, and is, moreover, an imposition on the public who do not use it."

Upon receipt of Dr. Wiley's letter it appeared I

would obtain the information I most desired and I immediately wrote to Mr. McElroy for more light upon the subject. He promptly replied as follows:

"I regret to say that I can give you very little information concerning the analyses of cigarettes at the present day. What analytical work I did was done very many years ago and the results were never published to my knowledge, having been made for the information of a congressional committee.

"About all I remember of the matter at present is that in the 12 or 13 brands I analyzed I did not, of course, find morphine, arsenic, and other alleged ingredients. Neither did I find alfalfa, a common rumor to the contrary notwithstanding. I found considerably more nicotine than expected."

During this correspondence the inspectors had delivered to me a number of samples for analysis and I decided to begin the investigation along lines that appeared most desirable, the details of which follow.

PREPARATION OF SAMPLES

The samples were not dried except as they were kept in the laboratory at a temperature of about 25° C. Any attempt at artificial drying might be at the sacrifice of nicotine and was, therefore, not attempted. The samples were next powdered so as to pass through a No. 20 sieve. If finer, so much the better, but it is difficult to obtain a powder of this fineness, even after passing the sample through a meat chopper several times. In case of cigarettes the papers were removed and all particles of the filler carefully dusted off, so as to obtain the papers as free from the filler as possible, separate analyses being made of the papers.

THE ANALYSIS

Determinations were made as follows:

Nicotine.

Ash.

Water soluble ash.

Water insoluble ash (by difference).
Hydrochloric acid insoluble ash.
Alkalinity of water soluble ash.
Alkalinity of water insoluble ash.
Opium and other drugs.

The tabulated report of the analyses of the twenty-six brands of cigarettes that were examined by Dr. Thurston will be found on the following page. The analyses for opium and other drugs, indeed for "dope" of any kind, utterly failed to reveal any such added medicinal substances in the fillers of any of the brands examined. Analyses were also made of three sorts of tobacco leaves with the midribs removed, and the average of nicotine in them was found to be 3.04 per cent., as opposed to an average of only 1.69 per cent. in the cigarettes.

In connection with the statement of Dr. H. W. Wiley quoted in the foregoing report, it is interesting to refer to a report on cigarettes that was made by this eminent investigator when he was chief chemist of the United States Department of Agriculture. Here is his statement:

U. S. Department of Agriculture,
Division of Chemistry,
Washington, D. C.,

June 13, 1892.

To whom it may concern:

I have examined samples of the following brands of cigarettes, purchased by me in the open market, and found them entirely free of any trace of arsenic or of opium or any of its active principles.

Respectfully, H. W. Wiley.

OHIO STATE ANALYSIS OF TWENTY-SIX BRANDS OF CIGARETTES.

FILLER.

BRAND.

BRAND.	Nicotine.	H ₂ O Sol. Ash.	H ₂ O Ins. Ash.	H C I Ins. Ash.	Total Ash. (Mineral Matter.)	Alk. H ₂ O Sol. Ash.	Alk. H ₂ O Ins. Ash.	Total Alkalinity Ash.
Nebo	2.03	3.46	18.34	...	21.80	1.53	12.18	13.71
Fatima	2.79	3.53	11.15	2.69	14.68	1.56	13.42	14.98
Hassan	1.94	3.73	12.83	4.31	16.56	2.35	7.40	9.75
Sweet Caporal	2.05	3.02	10.49	4.90	13.51	1.97	11.53	12.50
Nebo	1.93	4.03	11.71	3.20	15.74	1.98	18.38	20.36
Helmar	1.56	4.67	13.74	.02	18.41	3.89	22.69	26.58
Mogul	1.45	3.81	10.94	1.55	14.75	1.87	19.61	21.48
Egyptian	1.59	4.09	10.74	3.15	18.83	2.72	24.40	27.12
Omar	1.98	3.64	10.74	2.84	14.38	2.35	18.44	20.79
Murad	1.52	3.48	12.92	2.13	16.40	3.71	22.87	26.58
Royal Nestor	1.47	3.68	14.65	3.14	18.33	2.10	21.85	23.95
Turkish Trophies	1.44	4.08	12.92	3.08	17.00	3.00	18.95	21.95
Home Run	1.89	5.69	13.79	3.66	19.48	4.25	22.40	26.65
Home Run	1.87	5.48	12.87	2.30	18.35	4.25	22.50	26.75
Home Run	1.78	6.06	13.41	2.31	19.47	4.60	27.95	33.55
Piedmont	3.34	3.06	8.92	2.72	11.98	.45	13.05	13.50
Zubelda	1.97	3.63	10.68	1.93	11.98	2.28	18.55	20.83
LaLucbana43	6.92	15.01	2.12	21.93	6.50	23.60	30.11
Tareyton	1.75	3.67	10.51	1.65	14.18	1.36	18.39	19.75
Egyptienne Luxury	1.60	3.88	12.11	2.03	15.99	2.75	20.00	22.75
Fifty Six	1.43	3.27	12.23	2.09	15.50	3.10	19.45	22.55
Rameses II.	1.73	3.14	13.50	3.16	16.64	1.85	20.20	22.05
Schinasi	1.51	3.48	14.22	2.29	17.70	2.60	23.85	26.45
Condux	1.06	3.30	11.67	1.83	14.97	2.50	20.50	23.00
Egyptienne Straights	1.45	3.98	13.70	2.67	17.68	2.50	22.80	25.30
Egyptian Arabs	1.35	3.54	14.99	3.25	18.53	2.65	22.70	25.35
Makaroff	1.21	1.02	15.65	2.48	16.67	2.50	22.00	24.50
Phillip Morris & Company	1.48	3.50	13.44	3.10	16.94	2.00	20.50	22.50
Average	1.69	3.89	12.92	2.13	16.81	2.64	19.65	22.29

The brands of cigarettes that Dr. Wiley examined were thirteen of the most popular cigarettes of that time.

Dr. Thurston, in the Ohio report, says he was unable to find a published account of the analysis of cigarettes. He overlooked a very important one made by an authority of no less standing in the scientific world than *The Lancet*, of London. *The Lancet* is one of the most distinguished of medical publications, and, in reviewing its report, the *New York Medical Journal* referred to it as an "unimpeachable authority." The report, made December 9, 1899, is so important that we take the liberty of here reproducing the major portion of it:

In 1888 a rumor gained currency that cigarettes contained a large proportion of opium and "an unclassified alkaloid," and, further, that the paper contained arsenic, copper, or chlorine. The subject was obviously of great public interest, and *The Lancet* Analytical Sanitary Commission was appointed in 1888 to make inquiry on these heads, with the result that we were able to say in *The Lancet* of Oct. 20th, 1888, that there was no trace of opium or any "unclassified alkaloid" in the tobacco, not a trace of chlorine or arsenic in the paper, but there was a faint trace of copper due to the metallic lettering on the paper wrapper. The indictment to which we have referred nevertheless gained ground and eventually, about the year 1891, disturbed the minds of many people in the United States, where a large proportion of the tobacco supply of the world is produced.

This ultimately led to a very remarkable move-

ment against the use of the cigarette, which seems to show no signs of abatement at the present time in the States. The tactics adopted by the leaders of this movement are decidedly odd and, to put it mildly, somewhat illogical. Apparently an endeavor has been made to prove that cigarette smoking is responsible for the high lunacy returns, the ranks of the insane and criminal classes being, it is alleged, recruited from the boys who have been cigarette smokers.

So energetically was this statement put forward and with such credulity was it received, that we find in the press of New York such amusing headings as the following:

CIGARETTES MADE HIM A LUNATIC. A BRIGHT SCHOOLBOY BECOMES A CHATTERING BEGGAR FROM THEIR USE. MADE MAD BY SMOKING. DANCED, RAVED, AND PRAYED. STRAPPED TO STRETCHER, THE YOUNG TAILOR WAS CARRIED SINGING TO INSANE WARD. CIGARETTES CLAIM A VICTIM. BEGAN SMOKING THE WEED WHEN BUT A LAD AT SCHOOL, WHICH BROUGHT HIS LIFE TO AN END BEFORE HE WAS TWENTY-ONE AND PRODUCED A LARGE TUMOR ON THE BRAIN AND PARALYZED BOTH LOWER LIMBS. PUFFED OUT LIFE BY CIGARETTES. THE COLLAPSE CAME YESTERDAY AND DEATH FOLLOWED QUICKLY EARLY THIS MORNING.

We quote a number of similar excerpts. It remains to add that on investigation being made there was no foundation for the statement that death was due to cigarette smoking. In each case it was made perfectly clear that the cause of death had no relation to smoking at all. * * * But absurd statements of this kind continue to be made in the United States, and the subject has appealed to us (though a similar agitation has not yet arisen on any scale in this country) as one of general public interest and

one which merits inquiry. It should be stated, however, that some of the brands of cigarettes sold in New York may be obtained in this country. We therefore referred the subject to our New York correspondent, who informed us that there was a movement in New York of the kind which we have described, basing its indictment largely upon the averred presence of poisonous materials in the cigarette, without having regard to the question of the injury to health which may result from excessive or juvenile smoking.

Acting under our instructions, our correspondent secured various brands of cigarettes in shops in New York City and despatched them to *The Lancet* Laboratory for examination and analysis. At the same time our Commissioners purchased cigarettes of American manufacture at shops in London, bearing, in the majority of instances, the same brands. The results which have recently been obtained in *The Lancet* Laboratory are printed in the accompanying table. (This table will be found on the following page of this book.)

It will be apparent from this table that if any reproach exists at all it will be evident in the case of both the cigarettes purchased in New York and the same brands of cigarettes sold in London. As a matter of fact, the results in both cases show no foundation whatever for the exaggerated statements that have been made. * * *

It is true that tobacco normally contains certain organic bodies, sticky substances, which behave like sugar, but it is also true that glucose or saccharine matter is sometimes added to tobacco for a practical purpose. This is proved by the fact that the cold water decoction of some cigarettes yields a perfectly definite crystalline precipitate of glucosazone with phenylhydrazine. The addition is harmless. * * * The addition of glycerine in trifling amounts is at

DESCRIPTION.

PURCHASED IN NEW YORK

Weight in grains of tobacco in one cigarette.	Weight in grains of paper in one cigarette.	Amount per cent. of mineral matter in paper.	Ratio of paper (=1) to tobacco.	Amount per cent. of nicotine in the tobacco (undried).	Amount per cent. of moisture in tobacco.	Amount per cent. of mineral matter in tobacco.	Alkalinity of ash reckoned as K ₂ O per cent.	Percentage amount of chlorine in ash.	Saccharine matters reckoned as grains of glucose in one cigarette.	Bodies like glycine, yielding oxalic acid on oxidation—grains in one cigarette.
16.51	0.66	1.87	1:25	0.95	10.67	11.99	1.62	5.00	1.54	2.31
17.91	0.64	6.04	1:28	0.84	13.33	11.09	6.42	4.64	1.69	2.93
18.99	0.70	1.74	1:27	1.19	9.47	11.70	1.35	5.54	2.00	2.93
19.87	0.53	2.88	1:27	0.63	12.07	11.14	2.02	7.82	2.47	2.47
17.28	0.68	2.02	1:25	0.90	11.67	11.88	2.47	6.91	1.54	2.93
16.60	0.62	3.00	1:27	1.06	11.95	12.13	5.40	7.22	2.00	2.62
21.67	0.56	3.31	1:38	1.03	11.60	12.78	3.97	7.61	1.85	3.54
17.83	0.63	2.98	1:27	0.94	11.53	11.81	3.32	6.30	1.87	2.82

PURCHASED IN LONDON.

Weight in grains of tobacco in one cigarette.	Weight in grains of paper in one cigarette.	Amount per cent. of mineral matter in paper.	Ratio of paper (=1) to tobacco.	Amount per cent. of nicotine in the tobacco (undried).	Amount per cent. of moisture in tobacco.	Amount per cent. of mineral matter in tobacco.	Alkalinity of ash reckoned as K ₂ O per cent.	Percentage amount of chlorine in ash.	Saccharine matters reckoned as grains of glucose in one cigarette.	Bodies like glycine, yielding oxalic acid on oxidation—grains in one cigarette.
15.41	0.60	2.30	1:25	1.03	10.06	14.06	4.48	6.50	1.23	1.85
17.29	0.61	1.49	1:28	1.30	12.20	12.30	4.97	3.40	1.54	1.08
18.51	0.70	1.74	1:26	0.94	14.80	11.70	3.14	7.12	3.85	2.62
18.74	0.66	2.08	1:28	0.91	11.80	11.78	2.16	6.83	2.77	2.47
14.84	0.61	8.75	1:24	1.10	17.83	14.36	3.06	6.46	2.62	2.62
19.28	0.64	2.90	1:30	1.05	16.25	13.82	2.17	7.00	1.54	2.16
17.34	0.63	3.21	1:27	1.05	13.82	13.00	3.33	6.21	2.26	2.19

any rate recognized by the trade. We are of opinion that neither glycerine nor glucose in the extremely limited amounts shown in our analyses is in the smallest degree injurious.

To sum up, there is not a single factor in these numerous results upon which can be fairly based any allegation of the presence of a substance producing injury to health. As to the question of injury to health which may easily result from the excessive or premature smoking of tobacco in any form, that is quite beside the issue, the present inquiry only having reference to the statement that these cigarettes were injurious because they contained foreign poisonous ingredients; as we have said, a very careful search failed to elicit the slightest evidence on this head.

No one deprecates more than do we ourselves the appalling increase of the practice of smoking among juveniles, and if those who are so emphatically solicitous about the health of the young community would turn their attention to this aspect of the question with a view to the restriction of the objectionable habit, undoubted good would be done. But to make manifestly exaggerated statements will not ultimately help the case one tittle; indeed, it is more likely to aggravate the evil. * * *

It is worthy of note that the percentage amount of nicotine in the pure Virginia leaf invariably used in these cigarettes seldom exceeds, according to these analyses, 1 per cent. In other kinds of tobacco it may reach four times that amount. It is doubtful, however, whether any nicotine ever reaches the mouth of the smoker except that present in the moistened tobacco which is in contact with the lips. The smoke products of tobacco do not contain any important quantity of nicotine.

Another authoritative report is that made by Professor J. W. Mallet, of the Chair of

Chemistry at the University of Virginia. In 1898 he examined samples of five of the largest selling brands of cigarettes, and this was his conclusion:

Both tobacco and paper were in very considerable quantity, carefully examined for the noxious foreign ingredients which have been sometimes said to have been added in the process of manufacture. None of these could be found. Neither morphine, nor any other characteristic constituent of opium, was detected, nor was atrophine, strychnine, cocaine, or any other fixed alkaloid present in the tobacco. No traces were obtainable of any compound of arsenic, lead or copper in the paper.

The whole examination lends no support to the sensational stories occasionally circulated in regard to dangerous adulteration of cigarettes.

Our next expert witness is Launcelot W. Andrews, Professor of Chemistry in the State University of Iowa. In 1897 he made a careful analysis of three of the most popular brands of cigarettes, in order to ascertain whether they contained any injurious substances as adulterants or otherwise, and his testimony is:

*Reports of
Other
Reputable
Chemists*

The results of this examination were, in brief, that in case of all three brands, the papers used were free from arsenic and all other injurious metallic substances, and the tobacco was free from opium, saltpeter and other adulterations or sophistications.

The tobacco employed in the manufacture of these cigarettes contains much less nicotine than that commonly used in cigars or even for pipes.

Following Professor Andrews on the stand

comes Walter S. Haines, Professor of Chemistry in Rush Medical College, Chicago, who, in 1889, made a chemical analysis of ten different samples of Sweet Caporal cigarettes purchased in Chicago retail stores. Says Dr. Haines:

I have submitted all these specimens to chemical analysis, and would report that I am unable to find any morphine or opium present in any of them; nor am I able to discover any other alkaloid present except the nicotine of the tobacco.

When Dr. Haines was called upon, Chicago was suffering from one of our periodical anti-cigarette fevers, and there was a great hue and cry for a drastic ordinance against this form of smoking. The usual allegations were shouted, and an investigation by the city authorities demanded. Accordingly, City Chemist Cass L. Kennicott and Assistant City Chemist D. B. Bisbee, acting for the Chicago Commissioner of Health, made an investigation and presented a report in which they declared:

American cigarettes are made of "bright Virginia" (this is a technical term and means a tobacco grown in Virginia and North Carolina and warehoused for three years before it is used), and frequent analyses show that this tobacco contains only from 1 to $1\frac{1}{2}$ per cent. of nicotine. The mildest Havana contains much more, while the best grades of domestic cigars reach as high as $8\frac{1}{2}$ per cent. * * * The paper, considered merely as paper, which is wrapped around the cigarettes, is about as pure a form of paper as it is possible to get by any means.

Another convincing report is that made to the Massachusetts State Committee on Public Health by Professor James F. Babcock, who for five years was Professor of Chemistry in the Massachusetts College of Pharmacy, for five years Professor of Chemistry in Boston University, and for ten years the Massachusetts State Assayer. He gives as follows the results of his analysis of nine brands of cigarettes:

THE FILLINGS. Careful and thorough examination, both chemical and microscopic, showed that the specimens contained no opium, morphine, strychnine or other drug or poison foreign to tobacco. In short, the fillings in every one of the specimens were found to consist of tobacco and nothing else.

THE WRAPPERS. Analyses of the paper wrappers demonstrated the absence of any trace of arsenic, white lead or other poison. The papers were all of excellent quality (rice); in one specimen said to be made from corn husks. These papers contained such elements as are always to be found in the plants producing the fibre from which they are made, and contained no others.

Is still more expert testimony necessary? If it is, I can go on almost indefinitely presenting witnesses for the defense of the cigarettes—more and more expert witnesses of the highest repute—but surely this last will amply suffice. He is Professor Willis G. Tucker, who, when Analyst of New York State, made a chemical examination of four of the most widely sold lowest priced cigarettes “with a view to determining whether the tobacco of which they are manufactured contains opium

or other harmful or poisonous drugs, or the paper wrappers any harmful constituents." As indicated by the following extracts, his work, which was described in the ninth annual report of the New York State Board of Health, was very comprehensive and extremely thorough. He said:

On searching the chemical, medical and scientific journals and text books, no definite statement could be found to the effect that opium or other poisonous drugs or compounds were employed in the manufacture of cigarettes, or that the paper in which they are wrapped is contaminated by arsenic, or purposely impregnated therewith, or with other poisonous substances, nor were any analytical results found recorded showing that such is the case. Nevertheless, statements of this kind are frequently made in the newspapers on no other authority, and these statements, being carelessly repeated about from mouth to mouth, come at last, with no good reason, to be believed by many people.

The samples were carefully examined, and as fully as the time allowed for the work would admit, more particularly for opium, and the wrappers for arsenic, but no traces of either of these substances, nor evidence of the presence of any other poisonous substance foreign to the tobacco, were discovered in any of them. The tobacco of each was carefully scrutinized before analysis, but failed to reveal the presence of any foreign matter visible to the eye. The paper in which the tobacco was wrapped in each instance burned to an exceedingly minute white ash. * * *

Cigarettes are generally made from tobacco of good quality, and the anonymous sensational statements that appear from time to time in the newspapers to the effect that they are prepared from the

filthiest tobacco and the dirtiest refuse are not worthy of credence, and can easily be refuted.

As regards the paper wrapper, there is no reason why an impure or poisonous paper should be employed, and many reasons why it should not. I am ignorant of any facts proving such to be the case, at least so far as the leading American brands of cigarettes are concerned.

Concerning the alleged use of opium in cigarettes, a recent writer in a scientific journal says: "A silly but prevalent superstition is that cigarettes contain opium. If there were no other reason, the manufacturer could not afford to introduce the oriental drug into his goods."

In an ably prepared paper entitled "A Brief for the Cigarette," read by W. H. Garrison, of New York, before the Medico-Legal Society, November 17, 1897, so many unimpeachable authorities were cited, and such sane conclusions made, concerning the purity of the tobacco in cigarettes and of the paper wrappers about them, that it is no wonder that men of scientific repute have since refused to be led into the "added ingredients" trap. The wonder is rather that this drug falsehood keeps coming to the surface even in the lay mind. It is only another proof that popular prejudice is in the tenacious thing the most world, a mysterious power that sometimes survives for centuries the sword-thrusts of the truth.

Surely, in any event, the authorities cited in this chapter, their analyses and their deductions, should be conclusive evidence in favor of the cigarette and acquit it of the charges made against it. Indeed, these analyses should do even more. The reputable

chemists who made them not only affirmatively attest the purity of cigarettes, but negatively deny any impurity. It is impossible to conceive of a more complete and forcible manner of arriving at a correct conclusion.

To say that such reports do not demolish the opium, the arsenic and all other drugs-in-cigarettes fallacies would be to say that the science of chemistry has absolutely no value as a means to determine physical facts, and I, for one, am loath to believe that any educated man would make, at this period of the world's progress, any such assertion.

To quote again, the cigarette consists of "nothing but pure tobacco and the purest product of the paper-maker's art."

And now, what about nicotine?

CHAPTER X

SCIENTIFIC VIEWS ON SMOKE

Errors of Medical and Popular Opinion—Scientific Research in Europe—How Much Nicotine Does Science Find?—Experiments on Human Beings—Does Smoking Cause Ill Health?—Judging the Well by the Ill—Faulty Iodine Method of Analysis.

THERE is one phase of the cigarette question upon which all the enemies of the cigarette have united, and that phase is embodied, to their minds, in the one word "nicotine." Nicotine, they argue, is a poison; cigarettes contain nicotine; hence, to take cigarette smoke into your mouth is to put poison there. The proposition does, indeed, seem simple; it certainly expresses a belief widespread enough to justify consideration here and now.

Is nicotine harmful to normal man? Does the tobacco of the cigarette contain much of it? What, in short, is the composition of cigarette smoke?

You have but to examine carefully with a free mind the pleas of the cigarette's opponents in order to be struck with one salient fact: nearly all the arguments of these opponents are based on the results of experiments made upon the lower forms of animals. That sort of thing is sensational; it is easily written; it is more easily read. But it does not necessarily affect the problem of man's relation to the cigarette. Again, a goodly number of the arguments of these opponents have to do with

the use of tobacco during ill health or disease. That, too, is sensational, easily written and easily read; but that, too, is unscientific. To arrive at a scientific solution of the problem, it is necessary to consider directly and primarily the effect of nicotine on human beings in ordinary health and among the ordinary conditions of human society.

Why is that consideration never made in America? It has been made elsewhere, as you will see, and made, moreover, by competent experimenters; but it has generally happened that the experimenters were eminent European scientists writing in languages not easy for the American press to translate, and compiling tables and drawing technical deductions that require more labor than the busy pen of the journalist can find time to provide.

The statements that are now about to be made are the outcome of information which, *Scientific Research in Europe* in itself, is the result of careful and earnest research by a medical authority who has consistently sought his facts not only in the scientific publications of Europe and America, but also directly from clinic and laboratory experts in the Continental centers of learning, whose methods of arriving at truth are beyond cavil.

Those methods—the methods of technical investigation into the make-up and effect of tobacco smoke in general and of cigarette smoke in particular—require a knowledge of chemistry and physiology; they require the comparison of the make-up and effects of the

different forms of tobacco smoke—the smoke of the pipe, the cigar and the cigarette—and they require an ability to compare the different conditions under which the tobacco is smoked. The tests themselves are complicated; to be judged adequately they must be known in detail.

The recent history of these studies is told in a carefully prepared monograph by Dr. Pawinski, published in Polish (*Gazeta Lekarski*, 1913, xxxiii, pp. 682, 710). Cigarettes evidently are largely consumed in such countries as Poland and Russia, as indicated by the somewhat earlier investigations made by Professor J. J. Pontag and others. These men, like Pawinski, published reports on the effect of inhaling cigarette smoke—reports in which the composition of the tobacco itself is given in figures, together with a complete analysis of the substances found during the process of combustion.

Still another valuable essay that should not be passed over by the student is that of Biffis, who made a careful comparison of the effect of cigarette smoke on smokers and non-smokers, nor should one forget the important contribution by the Dutch professor, P. K. Pel, head of the Medical Clinic in Amsterdam.

It is the appearance of these publications, and the detailed knowledge of the subject thus put into our hands, that has aroused the new and widespread interest of earnest medical investigators. They are the most import-

ant addition to our authorities on tobacco since the publication of the articles of Kissling, Vohl, Eulenburg, Lehmann and Habermann. The works of this group will also be carefully considered, but on the particular point now under discussion—that is, the facts, not the opinions, about cigarette smoking—it is the new researches of Pawinski, Pontag, Biffis and Pel and their group that throw the most light.

The present tendency of competent students of tobacco is toward the belief that nicotine seldom occurs in cigarette smoke in sufficient quantity to exert any physiological effects at all and that, if the cigarette is harmful in some cases, the cause must be something other than nicotine.

How much nicotine does science, which has no end to gain save the truth, find in the cigarette? Kolprakstchy and Nikolski analyzed certain Russian brands and reported a find of two per cent. Dr. Fröhlich, another authority, pronounced, however, that the proportion of nicotine was lower even than that. As for the cigarette in general, Fröhlich agrees with the writers in *The Lancet*, of London, and the *British Medical Journal*, who base their statement on elaborate analyses of many kinds of cigarettes, including the popular American brands, and who unite in declaring that their investigations show that the most accurate methods of investigation give scarcely one per cent.

These essays may be regarded as the

poison and the antidote, according as the reader favors abstinence or smoking. The writers are not too prejudiced on the abstinence side, and their work itself is thorough and most skillful; it is new to the American public and it proceeds from men who display a profound knowledge of their art and an extensive experience of disease. One wishes, nevertheless, to be entirely fair, so that, when authorities disagree on the percentage of nicotine to be found in cigarette tobacco, one is justified in asking at least a little more evidence before accepting the theory that the smoking of cigarettes is connected with effects not established—is, in short, the cause of any of the ills that flesh is generally supposed to be heir to.

*How Much
Nicotine
Does Science
Find?*

Nobody is better qualified to speak on the question of tobacco smoke than Professor K. B. Lehmann, of the Hygienic Institute in the University of Wurzburg. His exhaustive essay on "Chemical and Toxicological Studies of Tobacco" is the most notable exception to the ordinary run of literature upon smoking. The original was published in the *Archiv fur Hygiene*, 1908-9. One of its distinguishing features is the studies on cigarettes carried out simultaneously by his assistants. Professor Lehman thus sums up his conclusions regarding the alleged connection between cigarettes and diseases:

The following considerations and experiences are obviously opposed to the belief that the bad effects

of tobacco smoking are due, partly or wholly, to nicotine.

(a) Vegetable leaves, free from nicotine, when smoked produce on lads the same effects as tobacco smoke. Such are the leaves of castania, the walnut, potato, Spanish root.

(b) Other writers have found in tobacco smoke, besides nicotine, other poisonous substances, which cannot be ignored.

(c) Experience and many facts of my own observation show *that without further evidence there is no proof that the strength of tobacco and its quantity of nicotine are proportional.**

Nor did Professor Lehmann content himself with that. Like a thorough scientist, he now proceeded to estimate the comparative effects of nicotine and other substances in tobacco smoke. He carried out his experiments with consummate skill, and his subjects were young men and lads. He discovered that, although the ultimate property of the smoke might for some time elude the scientist, the essential properties do not depend on nicotine or any poisonous substance.

Experiments on Human Beings Carginale did work that ably substantiated Lehmann's. He tried to seize and analyze the elusive quality by artificial means. Experimenting on animals, he exposed them to an atmosphere of smoke from cigars and cigarettes, now of tobacco containing nicotine and again of tobacco free from nicotine. He found no difference in the effects of the smoke from the two kinds of tobacco. Presumably no poisonous currents flowed from

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either kind. The animals were not affected except by overwhelming and stifling volumes of smoke.

The inference is clear. No one can satisfactorily account for the different effects of cigarette smoke on the human machine; it appears to be a matter of temperament. That there is something, perhaps in the air, which tempers and changes cigarette smoke is incontestable. One individual in a close room, another in the cool air; one individual in Europe, another in America—each is affected differently. Though the cigarettes may be of the same kind, the different individuals who smoke them manifest as many different characters—what the scientists call an acquired character, which is unexplained by the simple laws of health.

It is absurd to expect a man truthfully to tell you whether rye-bread is harmful, when he can base his opinion only upon his knowledge of alcohol; it is equally absurd to expect him to tell you whether cigarette smoking is harmful when his opinion is based solely upon his knowledge of nicotine. The difference between the effect of cigarette smoke and the effect of nicotine is sufficiently large—so much so that to disregard it altogether is to be guilty of the gravest of scientific errors. By the same process of reasoning we return to the fallacy of confusing the effects of a substance in illness with its effects in health. In certain illnesses a glass of milk is fatal.

Is there, in brief, a true connection between

cigarette smoking and ill health? To that query is reduced the entire question of the harm or benefit of cigarettes; and yet, with all that we know of human nature and its weakness, and with all that we know of the ignorance prevailing even now about the cigarette in medical circles, it is difficult to credit the bald assertion that the cigarette is a cause of ill health.

Does Smoking Cause Ill Health? Doubtless the cigarette has in many cases been smoked so excessively that the effects of the smoke and the force of the habit have given large opportunities for the development of diseases already existing; but "opportunities for development" are a far cry from "cause." Doubtless, too, we have all, or nearly all, certain tendencies toward disease and certain duties involving the care of our health; but it is not those tendencies or those duties that are referred to by the critics who would connect the cigarette with physical disability.

Nor is the influence of zeal to be wholly overlooked. I am not here questioning the motives of the visionary doctor or the impetuous legislator, but I am recalling the truth that zeal is often short-sighted—that it can rarely see anything but what it wants to see. The anti-cigarette advocate is usually exploited by political and social agencies whose interests are naturally enlisted on the side of the emotional aspects of human nature. It may be well to inquire whether his attitude toward the cigarette will bear a rigid, scientific scru-

tiny and whether a prejudice against smoking cigarettes is justified by exact knowledge.

It is my belief, and the belief of the expert authority whom I sought for information on the medical aspect of this subject, that doctors should be advisers on cigarette smoking in disease rather than in health.

It is surprising to find how little they know about the relation of the cigarette to the healthy man. They have a great deal to say about the effects of the cigarette on the man suffering from this disease of the heart, from that disease of the lungs, or from the other disease of the arteries; but of the effect of the cigarette on a man in good health—and as to whether there is any effect at all—they have nothing scientific to report.

These non-scientific advisers conclude, however tacitly, that what the cigarette does to the ill man it must do to the man who is well.

The fallacy of this confusion of the well man with the ill has, as a matter of fact, infuriated the European scientists who have devoted years of scholarly labor to the investigation of the cigarette. It has infuriated them quite as much as they were disturbed by the methods employed even in the investigations regarding the sick man.

*Judging
the
Well by
the Ill*

A case in point, a distinguished case, is that of the famous Italian chemist and physiologist Bosi, perhaps the greatest living authority on tobacco smoke. As long ago as 1909,

Bosi, in the *Riforma Medica* (p. 850), enumerated the methods of the investigators. He told of experiments with injections of nicotine, injections of tobacco emulsions, and of solutions of the oily products of the burnt leaves in cigars and cigarettes; and, in a final burst of impatience with the cigarette's enemies, he dismissed the entire subject with the question: "How can we have confidence in results that are neither logical nor rational?"

Nor will the unprejudiced disagree with Bosi. The fallacies that he is angry with are sufficiently obvious, and one of the commonest of them is this fundamental error: the average critic of the cigarette, bent on the search for nicotine, finds out, or thinks that he finds out, certain facts about nicotine, and jumps to the conclusion that the effects of smoke—that is to say, tobacco smoke—are necessarily the same. How unscientific that is surely need not be elaborated upon.

As a matter of fact, in the cases of most patients examined by physicians, the deduction from nicotine to smoke has been again and again demonstrated to be wholly incorrect. It was probably such a critic of tobacco that Carlyle had to do with—Carlyle, who lived the simplest of lives—when he wrote:

I had ridden to Edinburgh, there to consult a doctor, having at last reduced my complexities to a single question: Is this disease curable by medicine, or is it chronic, incurable except by regimen, if even so? This question I earnestly put; got response, "It is all tobacco, Sir; give up tobacco." Gave it instantly and strictly up. Found after long months that I

might as well have ridden sixty miles in the opposite direction, and poured my sorrows into the long hairy ear of the first jackass I came upon, as into this select medical man's, whose name I will not mention.*

Unusually good work has recently been done by E. V. Zebrowski and reported in the Russian Journal, *Russki Wratsch*. Zebrowski also experimented with the effect of tobacco smoke on animals, but he did so intelligently. In his exhaustive report there are scientific method and definite aim, for the cigarette is the sole object of his investigation, and in this respect no American experiments can parallel the precision and unity of the Russian's. In spite of a few difficulties in the method, the sincerity and directness of the author make his investigations a fit instrument for enlightening the public in regard to the cigarette. He describes his process in these words:

The animals (which were rabbits) were put in a glass chamber, where they were exposed for several months to the action of tobacco smoke. The chamber was made of glass of a capacity of twenty liters, with three holes made vertically in one of its sides. A rabbit was put in the chamber; a cigarette fixed in the lowest of the holes, the middle one being stopped with wadding, and the upper connected with a water pump by means of a system of glass and rubber tubes. The current of air from the pump and the rate at which the cigarette burned were regulated by alternately removing and replacing the wadding. The cigarette, which contained forty grains of Machorka (a cheap Russian variety) tobacco, was lighted, and the pump started. Combustion took place in fifteen

*Carlyle's *Reminiscences*.

minutes. At intervals the experiment was repeated, eight or ten cigarettes being consumed, or about an ounce of Machorka tobacco.

Zebrowski recognized that it is cigarette smoke, not a pure form of nicotine, that must be studied. Furthermore, he recognized the varying quality of cigarettes—that Machorka tobacco, for example, contains 0.85 per cent. of nicotine, whereas the higher priced tobaccos used in his experiments contain but 0.23—and that it would not be fair to conclude that the effects from the one sort would be the same as the effects from the other.

Those effects are clearly described. Care was taken that the fumes should be breathed in conditions as nearly as possible approaching those of actual smoking. The experiment was continued for months, and the observations and records were all made with the utmost care.

What was the result?

The rabbits were at first restless; then they became stupid; and then they lost appetite and flesh. Eventually, as the subjects acquired the tobacco habit, as one might say, there was at least a partial recovery.

That is absolutely all that the enemies of the cigarette can find to support their cause in the famous Zebrowski experiment, and it contains the whole strength and the whole weakness of the anti-cigarette case.

The rabbits ate less and weighed less after all those months in a glass jar and after inhaling for that time in great quantities

**A
Triumph
for the
Cigarette**

a form of smoke that they were not used to in small quantities.

Unfortunately, Zebrowski did not make experiments to show that the confinement without any smoke would have produced the same effects.

But what the Zebrowski experiment really shows on behalf of the cigarette is a vastly different matter. It shows that nicotine is no more dangerous in the cigarette than in the pipe or the cigar. It shows that nicotine cannot get into the blood by means of smoke inhaled into the lungs. It shows that the characteristic enjoyment of smoking is the result of purely chemical and physical reactions, causing changes in the nerves, in the senses and in the tension of the arteries.

It may show, what everyone admits, that cigarette smoking in excessive amounts, under abnormal conditions, or by persons theretofore unused to it, does affect appetite and digestion; but it unquestionably shows that there is a recovery even after such excesses, and it thus goes leagues toward demonstrating the hypothesis that a normal use of cigarettes, and even what some persons would call an excessive use of them, must produce, not ill effects, but equilibrium and normal exchange.

What is the weight of opinion in regard to the absorption of nicotine and other products of burning tobacco? Here are some of the opinions of men who use scientific reasoning and methods:

Fröhlich says: "It is by no means proved that free nicotine occurs in the smoke—it is combined with malic, citric, oxalic acids, and it is probable that this compound of nicotine is dispelled, unchanged, with the particles of carbon in the gases of the combustion of tobacco."*

Pawinski (*Gazeta Lekarski*, op. cit.): "The question concerning the occurrence of pure nicotine in the smoke from cigars, pipes, and cigarettes is not determined."

Bosi (*Riforma Medica*, 1909, p. 850): "Nicotine is so volatile that only 0.5 per cent. passes into tobacco smoke."

Thoms (*Verhandlungen der Gas. Deutsch en Naturforscher*, 1899, p. 664): "The chemical analysis of the smoke from twenty samples of tobacco showed 1.12 per cent. of nicotine." Professor Thoms is head of the Department of Pharmacy, University of Berlin; but as he used the iodine method of estimating the nicotine in cigarette smoke, too much importance should not be attached to his result. The iodine method gives too high a proportion of nicotine, but even this method in the hands of later investigators has revealed a smaller quantity than that discovered by Professor Thoms.

Thus in the *Pharmaceutical Journal*, 1912, p. 718, it is reported that the iodine method yielded the following percentages: 0.0795 and 0.1147.

**Deutsche Med. Wochenschr*, 1911. Page 2286.

Chapin (U. S. Department of Agriculture, Bureau of Animal Industry, Bull. 133), prefers Tóth's method to Kissling's, which has the drawback that all the alkaline substances go over into the distillate and are reckoned as nicotine. A similar objection to the method is made in *The Lancet*, of London.

*Faulty
Iodine
Method
of Analysis*

Pontag (*Zeitschrift für die Unters. der Nahrungs—und Genussmittel*, 1903, Vol. 6, p. 673) uses a somewhat different method. He tries to drive home the statement that long ago was disproved, to the effect that the strength of the cigarette is proportionate to its nicotine. He publishes quite remarkable tables intended to substantiate this belief. For example, in a series of 120 cigarettes examined, the smoke contained 0.61 per cent. of nicotine. Cigars and smoking tobacco, on the other hand, gave higher figures—1.4 per cent. and 2.7 per cent.

Professor Lehmann examines these various methods and results critically. His conclusion is that in every case the parallel between the strength of the tobacco and that of the smoke is defective. It is evident that the chemical elements that compose the strength of tobacco are not nicotine and its compounds. There is an inherent quality in tobacco—its strength, flavor, or perfume—which has hitherto defied analysis.

Habermann institutes a close comparison between the quantities of nicotine in the

smoke of cigarettes and pipes. He finds more nicotine in pipe smoke. Thus:

	Weight	Nicotine in smoke
Hungarian cigarettes	18.62	1.80
"Sport" cigarettes	12.76	1.70
Egyptian—three kinds	12.87	1.10
Knaster—pipe tobacco		
1	13.73	3.24
2	13.41	2.56
3	13.66	2.25
4	13.38	1.64*

Habermann analyzed the nicotine in the cigarette ends. He explains how the effect on the smoker may be increased by smoking cigarettes and cigars to the ends, in which the nicotine and products of the combustion of tobacco are condensed, making this part of a cigarette or cigar very strong. The proportion of nicotine there was found to be 3.3 per cent. His results confirm those of *The Lancet* and the *British Medical Journal*. Thus in *The Lancet*:

1. Pipe mixtures contain the largest amount of nicotine (2.04 to 2.85 per cent). Egyptian and Turkish cigarettes come next (1.4 to 1.6); a Havana cigar contains the least of all.
2. The cigarette, whether Egyptian, Turkish or American, yields the least amount of its total nicotine to the smoke found, while the pipe yields a very large proportion.†

*Hoppe-Seyler's *Zeitschrift für Phys. Chemie.* 1902-4. Vol. 40. Page 154.

†*The Lancet*, 1912. Vol. I. Page 946.

And in the *British Medical Journal*:

Pipe Tobaccos:	Nicotine
A. Very mild honey dew	1.65%
B. Smoking mixture, medium	2.04%
C. Perique	3.29%
D. Cavendish	3.83%
Cigars:	
E. Havana, mild	1.09%
F. Havana, same make, strongest	1.53%
G. Havana, another make, "mild"	1.95%
H. Indian, strongest	1.85%
Cigarettes (after removing paper):	
K. Egyptian	1.13%
L. Turkish	1.30%
M. Virginia	2.24%
N. Common	2.02%*

In the *Lancet* there is a comparison of the proportion of nicotine in the smoke of pipes and cigarettes:

	Nicotine in smoke
Cigarettes:	
Virginian	0.60%
Turkish	0.51%
Egyptian	0.21%
Smoking Mixture:	
Perique	2.25%
Cavendish	0.57%
Cigars:	
Havana	0.20%

One statement, but surely no more, should perhaps be made about certain letters that have lately appeared under the caption "Cigarettes and Cigars Compared" in several journals. Anybody who has read the present chapter will now understand that those communications are examples of curious

**British Medical Journal*, 1909. Vol. I. Page 911.

ignorance in writers of official position on such matters as the smoking of cigars and cigarettes and their comparative virtues. The most recent of these critics attack all cigarettes alike and make many gross mistakes about what are really undisputed facts concerning them. In their eyes the non-smoker can do no wrong, and the cigarette can do no right. Both assumptions are absurd. Anybody can balance the results of the tables just quoted, and anybody who does that will see that the smoke of a good mild cigar and that of an Egyptian or Turkish cigarette contain about the same amount of nicotine.

On the data thus presented, the friend of the cigarette might confidently rest this phase of his case. The authors quoted are all in the very first rank of scientists, and the weight of their opinion brings the balance sharply down into the cigarette's favor. In the case of both cigars and cigarettes, says *The Lancet*: "The results show no foundation whatever for the exaggerated statements that have been made."* The nicotine ghost is laid, and the smoke superstition passes up the chimney.

*Analytical Sanitary Commission on American Cigarettes, 1899, Vol. II, p. 1607.

CHAPTER XI

POPULAR ERRORS ABOUT TOBACCO

Differences of Taste a Source of Argument—The Case of the More Extreme Critics—Beef-Tea as a Mode of Inebriety—An Expert Witness Testifies—The Carbon Monoxide Myth—The Superstition about Furfural—Coltsfoot as a Substitute for Tobacco.

ALTHOUGH the so-called "nicotine argument" is the favorite with the critics of tobacco in general and of the cigarette in particular, it is by no means the only one. That we have seen in previous chapters and are still to see in chapters to follow. Here and now it is my purpose to consider a little group of alleged arguments of the wildest sort, which are, for the most part, among the most recent in the controversy and which, wild as they are, have found a really amazing circulation.

Primarily, however, it should be pointed out that this chapter is strictly an examination of the statements of those who oppose the cigarette and, by way of reply, of those who favor it. There is to be nothing whatever said about those straightforward people who simply preach their dislike of tobacco, or whose belief in the injury resulting from the excessive use of it prompts them to utterances that, even if inexact, are at least conscientiously conceived.

Nobody expects—and surely nobody will find—unanimity of opinion in this singularly

diverse world of ours. Perhaps nobody wants it, for if all men were of one mind progress would cease; and certainly sincere disagreement on matters of collective importance gives zest to life and a necessary spur to advancement.

There are just two things on which at least we Americans agree: we agree in a tendency to criticize one another's personal tastes and in disliking, each of us, any criticism of his own. As a nation, for instance, we have long been accustomed to a perfectly unhampered and quite legitimate use of tea, coffee and tobacco; yet the tea drinker who does not care for coffee always preaches against it and, when the coffee drinker condemns tea, always resents that condemnation as an invasion of his personal rights.

The cigarette smoker often finds himself in the same position; but, though this may be as it should, it does not affect the ethics of the abstract question as to whether cigarettes—or tea, or coffee, as the case may be—produce good or ill effects upon the human being. It means simply that, out of common courtesy, and without any prejudice to the principle involved, one is occasionally obliged to apologize for the rational pleasure of a cup of tea or coffee, or for that of a cigarette—and this because of no better reason than that there are persons who cannot use anything in moderation, other persons who are not permitted by their peculiar constitutions to use things that healthy men enjoy, and still other persons with tendencies perhaps toward dyspepsia

and certainly toward hysteria, who fancy that the entire race shares their ills and the dangers to which those ills lay them open.

It is the person who, himself disliking tobacco or unable to use it, believes that all mankind is like him—it is the person who would deprive all men of what he may not enjoy—it is that person and his wilder theories with whom I am now about to deal. Only the critics who faultily represent tobacco to the public are the concern of this chapter. To the others I would say that I do not advocate anything like the abuse of tobacco or apologies for its misuse. To all, nevertheless, I declare that the public must have something better to guide it than the misleading stories that from time to time get into print. Some of the worst critics of tobacco are men prominent in public life. Their utterances carry weight because of their achievements along totally different lines and it is only fair that the people should be shown how little foundation there is for those utterances. Others are men claiming to speak from personal observation and it is but right that the people should be shown how imperfect that observation has been.

Consider for a few moments the extent to which the more extreme critics have gone. The briefest account of it would make amusing reading were it not that so much that has been put forward has been advanced by people who really get a hearing and by people who pretend to speak scien-

*The Case
of the
More Extreme
Critics*

tifically. In reality, nobody can analyze these criticisms and retain a high opinion of the critics' logical powers—nobody can carefully study them and believe in the scientific attainments of those who originated them. They abound in misconceptions which demonstrate not only that the methods of investigation were faulty, but that the whole process was based on a misunderstanding of the subject in hand. The public willingly endures a little caprice and misstatement as long as valuable information is somewhere given, but it will not, when the truth is discovered, tolerate errors in regard to matters of health and principle.

And now to our examples. They are chosen without a bias in favor of either side of the case; they have been selected as genuinely typical.

For instance, there is a very peculiar medley of facts and fancies about tobacco in general in a work bearing the inclusive title of *Tobacco Habit*, by a Dr. Tidswell. In it we find this quotation from Dr. T. D. Crothers:

The tobacco addiction is usually associated with alcohol or other drugs, hence the tobacco disability is seldom considered. In reality, tobacco is a narcotic poison, and its use is not only dangerous, but it is certain to be followed with debility, mental perversion and exhaustion.*

Next consult that now obsolete work, *The Use and Abuse of Tobacco*, by Dr. Lizars, who solemnly declares:

**Tobacco Habit*. Page 35.

"The students attending the American colleges are said to destroy their physical and moral powers by smoking tobacco, so as to unfit them to become useful members of society."*

The students of American colleges will be pleased to hear this. But it is no smiling matter, for the chancellor of Leland Stanford Jr. University, Dr. David Starr Jordan, once wrote that cigarette smokers are "concerned with the sexton and the undertaker!"

And, finally, place beside these so carefully weighed utterances this from a *Treatise on Tobacco* written by Dr. Budget a little before the day of Dr. Lizars: that in America "it is no uncommon circumstance to hear of inquests on the bodies of smokers, especially youths, the ordinary verdict being 'Died from extreme tobacco smoking'."

I am not inventing these passages to ridicule the critics of the cigarette. The quotations are veracious and the assertions, amazing as they now seem to us, were at one time actually made and, in some measure, believed. Only so short a time ago as 1912, a writer in the *Journal of Inebriety* (p. 149) described the escape of a youth from capital punishment—*because he smoked cigarettes!* The upright judge charged the jury that the prisoner was deranged. He was acquitted, and the newspapers announced his acquittal in such headlines as: "Cigarettes Free Slayer!"

It is in the same *Journal of Inebriety* that a writer thus criticizes a very moderate article

**The Use and Abuse of Tobacco.* Page 17.

that had been published in the *Journal of the American Medical Association*:

The author is very minute in describing the possible ill effects from tobacco, but finally ends in a confused acknowledgment that tobacco may be of some value in saving persons from collapse, and that one or more cigars a day may not be injurious to certain persons. It would seem that the author himself must be a smoker, and to acknowledge the facts and conclusions from laboratory experiments as being beyond all question, would be to reflect on his personal opinion and conduct, hence he takes the middle ground and assumes that, while it is a very bad substance, it has some good qualities and might be of service to certain persons.*

That remark to the effect that the "author himself must be a smoker" is perhaps intended for delicate irony; but it rather gives away the critic's ideas of the qualifications for authoritative utterance upon the subject of smoking. They are, obviously, this: a man who uses tobacco is debarred, by the fact of his use of it, from being a good judge of it, a good student of its effect, or a reliable witness concerning it.

Really, this critic is a humorist.

In the same volume of the *Journal of Inebriety* he has an article on "Inebriety from Beef-Tea," which gives him an opportunity of developing the ideas that possess his mind about the general subject of inebriety, and about the hopes and powers which the new knowledge has opened—it

*Beef-Tea
as a
Mode of
Inebriety*

**Journal of Inebriety*, 1914. Page 79.

gives him that opportunity; it gives us an opportunity to see at its real value the critical power that he employed in his attack on the writer in the *Journal of the American Medical Association*. "It is a well known fact," he says, "that persons who have drunk spirits and recovered, find a substitute in beef-tea." Thus beef-tea takes its place among the world's intoxicants and shares the evil reputation of the cigarette. "I have seen," continues this critic—"I have seen many who showed great exhilaration after using these extracts, and later became stupid."*

All this sort of thing of course convicts itself in its mere utterance; but what are we to say when in a publication such as *Education* (Vol. 29) Dr. Crothers is quoted, with apparent approval, in the declaration that, though small in amount, the "poisonous products" of cigarettes are constantly taken into the blood vessels of the mouth and affect the senses? Whatever effect the preceding statements may have, this one is of the kind that demands refutation.

Nor is refutation from the highest quarters far to seek. The truth of the matter is that given by no less an authority than Sir Lauder Brunton, and may be found in his highly authoritative volume, *Therapeutics of the Circulation*. It is simply this: Tobacco smoke affects the sensory nerves of the nostrils and stimulates them. One of Sir Lauder's disciples pursues the subject even farther. In a

**Journal of Inebriety*, 1914. Page 151.

remarkably judicious paper on "Tobacco Smoking" in *St. Bartholomew's Hospital Journal* he says:

It is popularly thought that nicotine acts as a direct brain stimulant much in the same way as coffee or tea, but a simpler explanation is offered by Sir Lauder Brunton, that the effect is simply that of stimulating the branches of the fifth nerve, which in some way appears to increase the blood supply of the brain—an effect which can be produced by eating sweets and in other ways.*

Here is another illuminating quotation from *St. Bartholomew's Hospital Journal*:

The smoker can afford to laugh * * * when quoted cases of "poisoning" include influenza, tabes and dilatation of the heart as sequelae of each other and of tobacco smoking; when the soothing weed is given as a prominent cause of sterility; and it is stated that even the perspiration of a smoker being absorbed by his wife can poison the ovum and lead to abortion; whilst the opinion is added that the only women who suffer from cancer are the wives or daughters of men who have indulged to excess in tobacco.

After these charges the production of insanity is a modest expectation, but the perusal of such nonsense induces the conclusion that so far from tobacco smoking leading to insanity, there would appear to be irrefutable evidence that the latter results from its abstinence.

Occasionally the prejudice against tobacco has gone even higher than such admirable journals as *Education*. I select one of the most recent and most famous, for in any controversy it is only fair to give both sides every possible chance. A writer in the *Medical*

**St. Bartholomew's Hospital Journal*. January, 1913.

Times compiled what he called "A Review of Authorities Opposed to Tobacco," and started his article with the following proposition:

An unprejudiced inquiry into the mental and physiological effects of tobacco smoking establishes the conviction that this habit, even in moderation, is definitely and permanently injurious to both mind and body.*

That is not all. The writer in the *Medical Times* continues by quoting the physiologist Professor von Bunge in regard to the statistics as to smoking among Russian students, saying that of these (smoking) students, 12 per cent. were found to be suffering from some disease of the alimentary tract, as opposed to 10 per cent. of non-smokers.

This is so bad that the writer in the *Medical Times*, lightly mentioning the theory that moderate smoking is not injurious, declares it as his conviction that "either this position must be successfully established, or tobacco smoking is suicidal. * * * The following," says he, "are well recognized direct results of moderate habitual smoking: Tobacco blindness, a most stubborn form of permanent affection of the eyes; cancer of the lips and of the tongue and of the throat, diseases almost wholly confined to smokers. Bouchard of Paris, an authority on diseases of the heart and blood-vessels, names tobacco as one of the leading causes of these deadly maladies, which have increased enormously in the last ten years. Ten per cent. of all smokers have albumen in

**Medical Times*. June, 1914.

the urine. Dr. Wright of London showed that nicotine lowers the power of resistance of the human body against tuberculosis, and post-mortem examinations at the Phipps Institute showed that smokers are twice as subject to tuberculosis as non-smokers."

And still we are not at an end. Our critic has something to say about carbon monoxide as a product of tobacco—and, he adds, "four-tenths of one per cent. [of carbon monoxide] has destroyed human life."

I have quoted extensively from this writer—more extensively possibly than he deserves to be quoted—but my object is, as I have already indicated, to give a full share of the floor to opponents of smoking. The article in the *Medical Times* is one of the most effective attacks upon tobacco. Let us now examine it in detail.

First as to the original proposition that tobacco smoking, "even in moderation, is definitely and permanently injurious to both mind and body." This is a subtle way of reviving the old myth about the evil effects of tobacco on the brain—reviving it without taking the trouble to advance any proofs in its favor. In regard to the effect of tobacco on the mental powers, let us get the word not of an anonymous contributor to a journal, but that of Sir Lauder Brunton to whom I recently referred. In the famous *Practitioner*, of London, he says:

Smoking, in moderation, does not seem to be injurious to grown-up people, but there appears to be

**An
Expert
Witness
Testifies**

a general consensus of opinion that it is very distinctly harmful to growing lads. In adults, smoking appears to have a double action. It will stimulate the brain to increased activity and it will also produce a soothing effect in conditions of excitement. Its stimulating effect upon mental activity is probably partly due to the local irritant action of smoke upon the mouth causing reflexed dilatation of the vessels which supply the brain. Its action as a sedative is probably partly due to the necessity of breathing rhythmically while smoking, and to the soothing effect of watching the smoke as it issues from the lips or nostrils, especially when it is blown out in the form of rings. This is by no means an unimportant factor, for many people derive but very little pleasure from smoking in the dark.*

But what about those unfortunate Russian students? You remember that our *Medical Times* friend said that Professor von Bunge declared that 12 per cent. of the smokers among them were suffering from diseases of the alimentary canal, as opposed to 10 per cent. of the non-smokers. Well, they were not. The plain truth is that the *Medical Times* man misquoted the original report, for that report gives 10.69 per cent. of the smokers and 9.92 of the non-smokers, and Mendelson, the physiologist who made the examination, declared the difference to be too small to be of any value.

Tobacco blindness? By that term the critic evidently refers, though incorrectly, to a form of amblyopia, and that is not, in spite of his assertion, a "permanent" affection. It is cur-

**The Practitioner*, London, 1905. Vol. 75. Page 56.

able with care and regimen. In his article on the "Effect of Tobacco on the Eyes," Dr. Lyle of London says: "If the cases are recognized early, and treatment is commenced at once and properly continued, recovery may be complete."

That entire passage in which the critic compiles his list of tobacco ills is full of blunders. He says that "cancer of the lips, and of the tongue, and of the throat" are diseases "almost wholly confined to smokers," whereas medical science has not as yet found the cause of cancer and knows only that its most frequent victims belong to the sex that commonly does not use tobacco.

Similarly loose and misleading are the assertions about tobacco's relation to diseases of the heart and to albumen in the urine. The alleged connection between tobacco and diseases of the arteries is discussed in another chapter on the comparative effects of cigarettes and other forms of smoking. It has been found impossible to detect, in these cases, the effect of tobacco from other possible causes such as hard work, strain of various kinds, obesity, alcoholism and syphilis. As for the practical share that tobacco may bear in arterial disease, that is very well described by Dr. Turney in a paper read before the London Medical Society and published in the *Medical Magazine* in 1913, as follows:

Pure tobacco poisoning is a very rare thing. Nearly always you will have to disentangle the tobacco element from the age factor, the temperament factor,

and so forth, and if you are going to see these in their proper perspective you will stand in need of all the knowledge and common-sense you possess.*

There you have the established view. And you get it again in Professor Kunkel's *Toxikologie* (p. 687), where that famous author flatly declares: "Cases of tobacco intoxication are rare."

And now for the matter of the carbon monoxide, which has, for the lay ear, a decidedly terrible sound. Remember that our friend in the *Medical Times* said that "four-tenths of one per cent. has destroyed human life."

Has it? Professor Kunkel on page 326 of his famous book says: "A smoker may produce in an hour half a liter of carbon monoxide. This is too small a quantity to affect the health except in rooms ill-ventilated in which many are smoking." In other words, carbon monoxide can have ill effects only when the supply of oxygen in the air is diminished to an extremely low point. In the ordinarily ventilated room there would be little or no effect.

*The
Carbon
Monoxide
Myth*

Every now and then, however, the lay press brings up this subject of carbon monoxide in cigarette smoke. Thus in the *New York Times* for November 27th, 1914, a writer tells us that carbon monoxide enters the lungs and prevents the blood from coagulating, whereas, a little farther on, he says that it liquefies and dissolves clots when formed and is for that

**Medical Magazine*, Vol. 22. Page 549.

reason employed in embalming. Why, in any case, should it be harmful to prevent blood from coagulating? Clotted blood would soon stop the circulation and produce death. Yet letters to the same effect, and with the same mutually contradictory statements, have recently been published broadcast throughout the newspapers of England and the United States.

The true action of this gas on the human blood is stated clearly by the editor of *Taylor's Medical Jurisprudence*. Says he: "Carbon monoxide forms a stable combination with haemoglobin which cannot easily be broken up by physiological processes in the lungs"; and "beyond the bright red color of the blood there are no postmortem appearances either suggestive or indicative of carbon monoxide poisoning."* The chemical change mentioned here is too delicate to be detected save by the spectroscope, since other substances also produce a "bright red color of the blood"; but the carbon monoxide that is found in tobacco smoke, according to the authority Schmiedl, is either not poisonous, or else exists there in such a small proportion that it cannot be considered as having any intoxicating action upon man.

The other authorities who could be quoted are plentiful; there is Boveri (*Gazzetta degli Ospedali*, 1905, No. 64); Olendorf (*Ther. Monatshefte*, 1909, No. 6); Trillat (*Comptes rend. soc. de biologie*, Vol. 57, p. 469); Vavar-

**Taylor's Medical Jurisprudence*. Sixth Edition. Page 534.

ger (*Wiener klin. Wochenschrift*, 1906, No. 21); Vohl and Eulenburg (*Vierteljahrschrift f. ger. Med.*, 1878, 14); Abeles and Pashkis (*Archiv f. Hyg.*, 1892, p. 209). The evidence against this pure assumption of the influence of carbon monoxide on the smoker is overwhelming. It is a view that has been dropped by all of the competent writers.

Enough, then, of the critic of the *Medical Times*.

There is, however, another myth about the cigarette that should be laid aside. This is the superstition about furfural in the tobacco smoke. The best authority on the composition of smoke is Kissling, but he fails to mention furfural (*Zeitschrift f. angew. Chemie*, 1905, Vol. 18). Furfural is a very volatile substance and quite unlikely to be of any effect, irritating though it is in its pure state. Indeed, of its action in tobacco smoke there has been no serious discussion, and Dr. Turney says in the *Medical Magazine*, "The evidence upon which this theory is based [*i. e.*, the theory of the evil effects of furfural in tobacco smoke] is of the slenderest description."

*The
Superstition
About
Furfural*

One more of the supposed cases against the cigarette and I have done with this phase of the subject. Recently—to be exact, in its issue of January 30, 1915—there was published in an American weekly scientific journal an article on "The Detoxication of Tobacco." The name of the periodical we with-

hold from mention because it is a journal generally well edited and ably informed. One may be sure that any misinformation which it contains is rare and unintentionally placed there. Nevertheless, the statements made in the article in question were, because of the standing of the publication in which they were printed, of a character that demands their consideration in this book. The writer discussed his subject thus:

Innumerable attempts have been made to protect smokers from the harmful effects of nicotine. So far, however, this object has not been achieved without at the same time depriving the tobacco of its aroma and taste. Recently Ambialet, a French physician, read a paper before the Medical Society of the Department of the Rhone on one of these attempts. His plan is to do away with the defects of other remedies, and it deserves publication because of its simplicity. Dr. Ambialet has found that if the ordinary coltsfoot or butterbur, which is very common in the countryside, is mixed with tobacco the harmful effects of the latter are completely eliminated. He has himself smoked daily some forty cigarettes made of this mixture without feeling the slightest effect from the nicotine. At any rate the remedy may be worth a trial, coltsfoot leaves being perfectly harmless and cheap.

Dr. Ambialet claims that tobacco mixed with coltsfoot leaves retains its full aroma and taste, the only perceptible change, if any, being an additional flavor like that of Turkish tobacco. This added flavor should render the mixture very acceptable to most smokers.

This is all very well, but it is not the whole

truth. A glance at the original paper in the *Marseille Medical*, of 1914, shows several gross errors in the American journal's account, not to mention much that that periodical left unreported.

*Coltsfoot
as a
Substitute
for Tobacco*

For example, at the meeting at which Dr. Ambialet read his paper, that reading, as is usual on such occasions, was followed by a discussion, in the course of which Dr. Pon-thieu, one of the members of the Medical Society of the Department of the Rhone, aptly remarked that it would first be "necessary to be certain that tussilago [coltsfoot] contained no alkaloid." To this Dr. Ambialet replied: "I have smoked thirty cigarettes [not some forty, as reported in the American journal] daily without feeling any malaise."

That is no mere detail, nor are the following facts mere details. After saying that the flowers of coltsfoot were used to make his cigarettes, and that the stamens, when burnt, gave off an aroma "sensibly like Oriental tobacco," Dr. Ambialet went on to remark:

"After having made a prolonged use of cigarettes made with these stamens, I think I am justified in pointing out the advantages which smokers might derive from these flowers in case they wished to diminish the action of tobacco on their own systems or suppress it entirely."*

Clearly, Dr. Ambialet's intent was to use coltsfoot as an antidote for tobacco. He did

**Marseille Medical*, 1914. Page 353.

not mean that the flowers "detoxicate" tobacco, but that they detoxicate the system of the smoker. If indeed they gave, when mixed with tobacco, an aroma that is Oriental, there is nothing new in that. In fact, the leaves of the coltsfoot, which the French also call *pas d'ane*, or ass's foot, were smoked by the ancients, as Pliny informs us, and in Germany they have long been used as a substitute for tobacco.

Our American commentator is scientifically unwarranted in his statement that when coltsfoot is mixed with tobacco "the harmful effects of the latter are completely eliminated." Dr. Ambialet's individual experience is solitary; it is unsupported by chemists and physiologists. Investigation has shown, as will be found recorded in another chapter of this book, that the smoking of leaves and herbs of various kinds have effects similar to those of tobacco. The agreeable effects that Dr. Ambialet experienced when he smoked his coltsfoot flowers show only that they suited his especial case, or especial taste, and the good French doctor ingenuously argues from the particular to the general and assumes that what suits one man must suit all mankind.

This does not reflect on the society before which he read his paper. From the printed proceedings of that society it is evident that Dr. Ambialet's statements left his hearers unconvinced. In the printed report there is given a warning by Dr. Ponthieu to the effect that there may be an alkaloid—in other words, a substance chemically like nicotine—in the

leaves and flowers of the coltsfoot. This very point was, in fact, carefully investigated with a result that will serve as a moral for nearly all these tobacco stories, and for quite all the stories of substitutes for tobacco.

Consider again the article in the American periodical. There the writer says of Dr. Ambialet that "he has himself smoked daily some forty cigarettes of this mixture"—the "mixture" being tobacco and "the ordinary coltsfoot." The writer is evidently not aware that the flowers, leaves and root of coltsfoot have varying effects and in many respects a different composition—a fact that the slightest knowledge of botany should have suggested. Yet the doctor was himself aware of the distinction and was careful to say:

"People who have heart disease, or a tendency to it, and all who have troubles of the organs of breathing as well as symptoms of tobacco intoxication, to whom tobacco is therefore forbidden, should certainly prefer these cigarettes made of the *stamens* of coltsfoot to cigarettes of eucalyptus or of tobacco deprived of its nicotine."

Now, the real composition of coltsfoot has become better known since the days when the ancients smoked it, and Dr. Ambialet should have been aware of it. Bondurant first analyzed it in 1887, and his report of that analysis will be found in the *American Journal of Pharmacy*, 1887, p. 340. He found a number of medicinal substances and a bitter principle that gave the reactions of a glucoside. More lately the plant has been better studied. It

contains tannin, a volatile oil, a gelatinous substance, pectin, and a powerful irritant poison, saponin. It is possible that the stamens do not contain these poisons in appreciable amount, but the powers of the leaves were well known to the Greek writers Hippocrates and Dioscorides, who describe the effects of decoctions from them in throat troubles; and it is certain that coltsfoot is not quite a harmless substitute for tobacco.

So all these attacks upon tobacco pass, upon examination, into the limbo provided for their predecessors. Never was truer word written than this: that the criticism of tobacco is "an admirable illustration of the effect which thought, constantly directed in a wrong channel, may have in warping the judgment." That is the opinion of F. W. Fairholt, F.S.A., whose monumental volume, *Tobacco: its History and Associations* has become a standard. I shall give two pertinent quotations from that work:

*Are We
Worse Off
Than Our
Fathers?*

"Who shall decide when doctors disagree?" has been asked in many similar cases: in this one doctors have disagreed to an unexampled extent. * * * Some opponents find every disease under the sun originating in tobacco smoke. Others declare as loudly in its favor, and quote quite as many instances of good resulting from the practice. Truth, as usual, seems to lie between, undiscovered by the belligerents, but perfectly well known to "the honest smoker" who wonders from amid his peaceful cloud what all the turmoil means. * * * Alas! gentlemen fighters, know you not that the herb first gained its reputation for its extremely sanatory uses? And that doctors

themselves first affirmed it to be "the most sovereign and precious weed that ever the earth tendered to the use of man?"

There is a narrowness of spirit among the oppositionists which takes a persecuting feature, and induces dislike and doubt of their tenets.*

And thus he ends his chapter on the controversies over tobacco's merits:

Some physicians have been pleased to ascribe pernicious effects to the use of tobacco, upon about as good evidence as a gipsy tells fortunes by counting the furrows of the palm of a country girl's hand. A correspondent favors us with an extract from a paper read before the British Association at Southampton, in which a truly horrid train of evils is traced to the continuous use of this poisonous substance. The poison, it would seem "pervades the digestive and respiratory system, the circulating system and nervous system, diminishing the moral and intellectual powers." Instead of all this detail, and much more of the same sort, why did not the learned essayist say at once that the baneful drug pervaded soul and body? With "death in the pot" by one set of philosophers, and "death in the pipe" by another, the wonder only is how we came to live longer than our ancestors of the reign of King Henry the Eighth, who never saw and never heard of a tobacco plant. Three hundred years ago a few American savages only consumed tobacco, and now it is consumed by all mankind, being the only commodity common to the consumption of all races and all social conditions. Are our lives shorter, our morals worse, or our intellects weaker, that for the better part of three centuries "the poisonous drug," according to this hypothesis, has been circulating through the veins of ourselves and our forefathers?

**Tobacco: its History and Associations.* Page 7.

Men of every race and of every climate have been using stimulants of one sort or another from the days of Noah, and probably will continue to do so for the next four thousand years in spite of chair or pulpit. The question to decide is which stimulant is most innocuous. * * * We are not to be frightened out of our wits by Dr. Laycock's awful array of terrors, attested though they be "by experiments demonstrating the physiological action of the drug on animals," that is, experiments to show that what may be injurious to a dog that dies of old age at sixteen, and to a rabbit which breeds seven times a year, and hardly lives five, must be equally so to a creature that lives seventy or eighty years, and whose ingenuity has altered the very face of the planet he dwells on.*

That, I take it, will be the verdict of most men. Surely the typical examples of popular fallacies that have been cited in this chapter, and the elaborate arguments against tobacco that have been reproduced and answered, leave the impression that the writers who attack tobacco in general and the cigarette in particular have not examined the authorities and are not sustained by them. That extremely complicated thing, tobacco debate, has about it little that is new. The main arguments were put forward and exploded long ago, and to repeat them now, without knowing the results of modern scientific investigation, is to engage in a stereotyped routine that is daily growing less and less effective.

Most of the opponents of cigarettes are coffee drinkers or tea drinkers, yet there is no argument against tobacco that cannot be

**Tobacco: its History and Associations.* Page 10.

paralleled by an argument against coffee or tea. The fact is that in all these criticisms from men of one sort of taste, upon men of another sort, there is a decided tendency to make a familiar and rapidly extending custom take on a fictitious resemblance to really bad habits, until tea and coffee are given a mask resembling the hideous face of opium, and violent investigators endeavor to find a connection between the taste for tobacco and that for alcohol.

It is this absurd sort of thing that I have dealt with in the chapter now closing and that it were well now to forgive and forget. For the rest, since the vast majority of civilized men now use tea, coffee and tobacco, it must certainly appear to this majority that some clear ground of necessity, or of obvious advantage, should be shown before such simple, natural and well established enjoyments are interfered with or curtailed.

CHAPTER XII

THE VOICE AND SMOKING

Investigation Reveals No Added Ingredients in Cigarette Tobacco—Nearly All Great Singers Smoke Cigarettes—Science Favors the Cigarette above Other Forms of Using Tobacco—The “Tobacco Heart” Fallacy.

TO ANYBODY unacquainted with the vagaries of the anti-cigarette crusader, it would seem that, having disposed of the myths mentioned in the previous two chapters, the last ghosts which it was possible for any mind to raise against the cigarette, however zealously prejudiced, must surely have been laid. Not so. The enemy of cigarette smoking is nothing if not imaginatively fertile. There remain still other fallacies to be controverted, and, facile as the task is, the crusader has himself been so active that this work must now be performed.

There is, for instance, the oft repeated statement that cigarette smoking injures the voice. There is, too, the once widespread nightmare of the “tobacco heart.” It is with these that we come now to deal.

Writers in medical journals, and scientific writers in general, have, I find, almost invariably treated in conjunction the subjects of the comparative effects of the different forms of using tobacco and the relation of the use of tobacco to the human voice. I have therefore found it most convenient, and perhaps most effective, to combine those two topics here.

Moreover, since these subjects raise questions that are best answered by authorities, it has seemed proper that I should continue the method heretofore pursued in this book, when any matter of controversy was touched upon, and devote myself not to the expression of personal opinion, nor even to the results of personal experience, but almost entirely to quotations from the writings of scientists and experts that have devoted many years to the study of the problems involved. These experts have been chosen without prejudice, and in order to bring out the main points of the argument, I shall, for the most part, depend solely upon a liberal italicizing of the more significant phrases in their conclusions.

However, there is one question to be asked and one statement to be made.

In the first place, any open-eyed investigator of the problems that now confront us cannot fail but be struck by the fact that no physician has specialized in the treatment of the alleged ill-effects of tobacco. Authorities are many, but specialist there is none. Now, ours is an age of specialization, and in no profession has it been carried to such a degree as in medicine. The medical profession specializes in nearly every known disease, but we have yet to hear of any such physician as a tobacco or nicotine specialist.

If smoking is the danger that its opponents attempt to prove it to be, how does it happen that the medical profession has not specialized on this subject?

Next, I want immediately to call attention to this: whereas, among the score or more of authorities that have written about tobacco (authorities on physiology as distinct from those in tobacco troubles) there are a few maintaining that the harmful effects result from smoking when indulged in to excess, there are only three who express the opinion that these results are more noticeable from cigarettes than from the pipe or the cigar.

Throughout the conclusions of all the others, the sole point of disagreement is as to whether the pipe or the cigar should be placed first as productive of such effects when excessively used. It is agreed, with but those three dissenting voices, that, of all forms in which tobacco is used, the cigarette, if harmful at all, is the least harmful.

Throughout the course of this book it has thus far been my endeavor, whenever we come to a disputed point, to present first the side that is unfavorable to the cigarette. I hasten, therefore, now to record the utterances of the trio of dissenting voices above referred to.

The Lancet, of London,—which we have readily admitted to be one of the world's leading medical journals—is one of these; but *The Lancet*, in placing the cigarette first on its list, at the same time proves that cigarette tobacco contains less nicotine than either cigar or pipe tobacco. In that journal's very exhaustive analytical examination of English and American cigarettes, made by a specially appointed commission, whose report is dated December 9, 1899, it was said:

"It is *possible* that cigarette smoking in particular is more injurious than any other form of smoking, but this, in the majority of instances, may be referred to the method rather than to the materials of the cigarette."

The task of *The Lancet's* Analytical Commission was, as we saw in a previous chapter, to ascertain whether or not any foundation could be found for the persistent rumors that tobacco cigarettes contained added ingredients, such as opium, arsenic, chlorine, etc., and its thorough chemical examinations, to quote from the report, "failed to elicit the slightest evidence on this head." In every way, excepting in the matter of comparison with other forms of smoking, the cause of the cigarette has been helped and furthered by the report of this commission.

*No Added
Ingredients
in Cigarette
Tobacco*

So much for *The Lancet*. The second of the three authorities who place the cigarette ahead of the pipe or cigar in relative possible ill effect is Dr. H. Lambert Lack, surgeon to the throat department, and lecturer on diseases of the throat, in the London Hospital, and surgeon at the Hospital for Diseases of the Throat, London. Although space here forbids the reproduction of Dr. Lack's article in full, it is only fair to say that he claims that the ill-influence of over-indulgence in tobacco cannot be denied altogether, for he writes:

"Undue indulgence is strong tobaccos may be a contributory cause of dyspepsia and thus

react on the throat. Also excessive cigarette smoking, especially when the smoke is inhaled, and perhaps, one may add, when associated with excessive expectoration, is liable to cause a pharyngeal catarrh, more particularly in young people."

Also in fairness, there is another portion of Dr. Lack's article that should be mentioned. This is a section in which he quotes other authorities who claim that tobacco is among the frequent causes of affections of the throat, but he says that *his own long experience does not agree with their findings*, and he goes on to declare:

The mildly stimulating effect of tobacco smoke upon the upper air passages may sometimes be apparently beneficial. Patients suffering from a dry post-nasal catarrh or tracheitis find great relief from an early morning cigarette. The irritation of the smoke probably excites a little hyperaemia and secretion, and enables the patient to expectorate more freely and clear the air passages. It is doubtful if harm can be ascribed to this. * * *

To sum up, from what has already been said it will be seen that tobacco exerts a mild stimulating effect upon those parts of the upper air passages with which the smoke directly comes in contact. When the air passages are otherwise healthy, these effects are slight or unnoticeable, and no harm results unless the patient is of tender years and smokes or inhales cigarettes excessively.

Elsewhere, Dr. Lack has been even more favorable to the cigarette. *The Practitioner*, like *The Lancet*, of London, is one of the world's standard medical journals, and, writ-

ing in *The Practitioner* on "The Effects of Tobacco," Dr. Lack has said:

My own experience, corroborated by careful inquiry amongst a large number of singers and other professional voice-users, leads me to believe that the results of tobacco smoke on the throat are greatly exaggerated. Many singers with first-rate voices state that smoking has little or no effect upon their throats. *Mario, the great tenor, smoked and inhaled cigarettes constantly.* I think it would be safe to state that *moderate smoking never originates any affection of the throat worthy of the name.* At the most it causes a slight hyperaemia of the parts with which the smoke comes in contact, or an insignificant catarrh.

In the great majority of affections of the upper air passages which are ascribed to smoking, careful investigation will show that other and more potent causes are at work and that tobacco plays a minor part. Post-nasal catarrhs, which are so commonly ascribed to excessive smoking, will be found much more often to depend upon some definite affections of the nose, upon chronic dyspepsia, alcoholism, etc. In a patient at present under my care a long existing post-nasal catarrh ascribed to cigarette smoking has been found to depend upon a sinus suppuration. An apparent justification for blaming the tobacco arose from the fact that the catarrh greatly diminished when smoking was stopped. In like manner a chronic pharyngitis, a rawness or burning feeling in the pharynx, a little irritable cough or slight huskiness of the voice ascribed to smoking will more often be found to depend upon alcoholism or dyspepsia. The so-called "relaxed" or "gouty" throats, especially in old people, are far more often due to champagne than to cigars. *There is no sufficient evidence to prove that malignant disease of the throat is due in any way to smoking.*

This from a surgeon who is recognized in the medical profession as one of the highest authorities in the world, if not the foremost, on diseases of the throat and of the upper air passages.

There is a good deal of significance in Dr. Lack's mention of Mario, who, as Owen Meredith says, could

"Soothe with a tenor note

The souls in purgatory";

and the fact that this great tenor "smoked and inhaled cigarettes constantly" led me to an investigation of the attitude of other singers toward cigarettes.

I went about this in no partisan spirit. I wanted only to find the truth. The results,

*Nearly All
Great Sing-
ers Smoke
Cigarettes*

however, have made it seem to me that, if one were seeking evidence that the smoking of cigarettes is not injurious to the voice—indeed if he were looking for evidence that the cigarette even is beneficial to the voice—he could find nothing more conclusive than the fact that nearly all great singers are habitual cigarette smokers—for that fact is precisely what I found.

Here, however, to give the names of the notable male singers who are cigarette smokers would be like publishing nearly the entire male personnel of the grand opera companies of the world. This is to say nothing of the celebrated women singers, for it is well known that many of them—trained in the famous music centers of Europe where smoking is taken as a matter of course—smoke cigarettes.

Both maintain that not only are their voices uninjured by the habit, but that they consider smoking to be often beneficial.

Let us take, for example, the case of Caruso, the most popular tenor of the present day. Caruso smokes cigarettes and has smoked them for years. Is it possible for a moment to suppose that the possessor of a voice which is his fortune—a voice that earns for him \$2,500 every time he sings in public—would continue to smoke if he thought that the practice were injurious in the slightest degree to that voice? There is evidence that instead of considering the smoking of cigarettes injurious he thinks that it is beneficial, for he puffs cigarettes even between the acts of an opera, reappearing to thrill his audiences with the marvelous clearness and beauty of his notes.

Caruso is but following tradition. Careful inquiry at the Metropolitan Opera House in New York brought forth the information from people who have been in close association with the singers for years, that there had not been, to their recollection, a male singing artist of the first rank in that organization who was not a cigarette smoker of greater or less degree.

I have nowhere found it recorded that any famous opera or concert vocal artist has ever been incapacitated by a throat affection that could be attributed to smoking, and most of the players in the great orchestras, as well as most of the famous conductors, are smokers of either the cigar or cigarette.

So much for the questions raised by *The*

Lancet and Dr. Lack. On the other hand, not a few really ludicrous statements have been encountered during the investigation of data on this subject, and one of the most ludicrous forms our third adverse opinion and was attributed to a physician of Hartford, Conn. This was a Dr. T. D. Crothers. In *Education** he was quoted at some length as saying:

"Cigarette smoking is the most dangerous form in which tobacco can be used, because combustion goes on so near the mouth that all products of burning are drawn into the mouth without change and are absorbed by the blood vessels and carried to the brain. In the pipe and cigars many of the products from burning are condensed in the stem of the pipe and body of the cigar and never touch the mouth. In the cigarette these poisonous products, small in amount, are constantly taken into the blood vessels of the mouth and affect the senses."

Of course, nothing could be more erroneous than these statements, and, of course, their exact opposite has long since been fully established by scientific observation and experiment. So much, the remembering reader will recall, has already been demonstrated.†

In this connection it is worth while here to quote at some length from an excellent paper on "Cigarettes—Effects Compared," by Frederick Sohon, M. D., of Washington, which

*Vol. XXIX, p. 301.

†See the citation of the studies of Lehmann and Habermann in Chapter X of this book.

was read at a meeting of the Medical and Surgical Society of the District of Columbia, and later published in *The Virginia Medical Semi-Monthly*. After discussing the cigar and pipe from several angles, Dr. Sohon proceeds:

Locally, the cigarette is less harmful to the smoker. The tough, dry, glazed, scabby pharynx of the smoker of a strong pipe, or the congested, follicular membranes, with engorged veins and hypertrophic papillae of the cigar smoker, is not found in the user of the cigarette.

Tobacco smoke is an irritant by virtue of its peculiar vapors, as well as the smoke itself. *The hot fog of a pipe or the heavy cloud from a cigar work far more decided textural changes than the thin and cool haze of a cigarette.*

The cigarette smoker's throat is moist; he does not hawk nor scratch, and if any symptoms are shown they are in the other direction and he will usually have to expel an overproduction of thin, non-viscid mucus, which is apt to settle in the larynx. While the damage is so slight texturally as not to affect the gross appearance of the membrane, the area of action is more extended, owing to the almost universal practice of inhaling the smoke. The cigar, as well as the cigarette, affects the nose, the former being more injurious, but the cigar smoke is hardly ever drawn into the bronchi, because it is so much denser, hotter, and more irritating than the cigarette smoke that it cannot be done with impunity.

It is popularly supposed that the smoke is drawn into the "lungs," which, to the lay mind, is an unknown organ in structure and action. As the bodily movement of inspired air ceases before the bronchioles are reached, and the process completed by gaseous diffusion, the smoke inhaled cannot reach, in

the short inhale, the really delicate structures, and what is deposited is (unless absorbed, which must be to a minute degree, when we consider that it takes a lifetime of city smoke and dust to pigment the pulmonary lymphatics), carried outward, and not inward, by the ciliary action.

Only in cases where the consumption is inordinately large does inhaling create a cough. Protracted over-indulgence can even create a purulent bronchial catarrh. Cigars or pipe do not do this, because they are not inhaled; but neither can the cigarette fiend so far insure himself as to entice an epithelioma. I am aware that this is rather a "Roland for an Oliver" argument, but it is given intentionally to give the abused cigarette a chance to divide its claims to popular disapproval. I believe that a *census of smoking singers would show a large preponderance of cigarette users, and certainly one can sing with a clear tone after using a cigarette, but not after a cigar.*

My statement as to the *comparative harmlessness of the local action of cigarette smoke, when used in moderation*, will possibly be contradicted, but they are my views as the result of very many throat and nose examinations. * * *

It seems to me one is better able to judge his dose by the cigarette. He feels its action at once, when he wishes it, it is gone quickly, and let alone when not wanted; while from the cigar, he feels the full and deep action for hours. Many cannot smoke a cigar, being easily affected by tobacco, without becoming irritable, nervous, depressed, and shaky with anorexia and insomnia. I am one of these; so to continue the idle habit, as you do with your cigars, I use the milder form of the cigarette.

If we allow the fact that one intends to smoke, in what is the cigarette more harmful than the cigar? I see no other objection than the greater liability to

the formation of a habit of over-indulgence due to the greater satisfaction from inhaling and the more frequent use permitted on account of smaller separate doses. But are we not too apt to say that one has the cigarette habit simply because his indulgence is more noticeable on account of the frequency of smoking, and not on account of the amount of physiological perturbation? It is altogether a question of the personal equation. One may easily smoke a cigarette every hour, and still not inflict as much damage as another will do with his two or three cigars a day.

Were it not for the inhaling, cigarette smoking would be less harmful than the eating of pie; but it is needless to consider it from this point, for all cigarette smokers do inhale to a greater or less degree, and derive their main satisfaction from so doing.

Dr. Sohon then proceeds to give a scientific explanation of the stage one reaches when he may fairly be said to be addicted to the cigarette-habit, and after decrying excessive indulgence, the Doctor concludes his paper by saying: "He who would dance must pay for his fiddling proportionate to his pleasure. If he knows enough and is careful enough not to pay too dearly, *the user of cigarettes derives as much satisfaction from his smoke with less harm than he who smokes cigars.*"

Of the same mind as Dr. Sohon was the late Lord Goschen, who, as nobody will deny, was exceedingly wise in his generation. He saw what, indeed, every intelligent person should today clearly recognize: that is, that the alleged harmful effects of smoking depend to a great extent upon the individual affected.

Lord Goschen said in effect that the cigarette was a useful innovation; that it lessened the consumption of wine; and that it affected the health less than the nicotine-laden channels of the pipe and the ever stronger and stronger stump of the cigar. Like him, Hare has placed the cigarette below the cigar and pipe in power, giving the order, from mild to strong effects, as chewing, cigarette smoking, cigar smoking, pipe smoking.*

It was, in short, a thoroughly modern opinion that Lord Goschen expressed when he asserted:

"In all that has been said, we agree to the principle that *the cigarette is to-day the manner of smoking that exposes the smoker least to the hurtful effects of which he may be the victim—effects peculiar to tobacco.*" Indeed, there is only one objection that the most recent authorities make to the classification laid down by Hare: they hold that chewing is the least desirable form for the use of tobacco. In all other respects they hold as strictly just the order above quoted and they maintain that it gives, therefore, a clear idea as to where the power of the smoke begins and where that power ceases.

The relative effect of the cigarette, cigar and pipe as Sir Lauder Brunton, a very distinguished English authority, has shown, de-

**Use of Tobacco*, p. 81.

pend upon the amount of free oxygen admitted to the combustion of tobacco in the three forms of smoking. That is to say that a pipe, in which the tobacco is inclosed in the bowl, allows less oxygen to have access, while a cigar, loosely rolled, and a loosely rolled cigarette, allow more.

The "seasoned" pipe, and the cigar half burnt and moistened by saliva, become strong; while the cigarette, if held lightly between the lips and smoked slowly, is not only the mildest of all, but admits less smoke into the mouth. The main stream of smoke, the "hauptstrom" of Lehman's and other experiments, does not enter the mouth except to a very slight degree and is therefore absorbed only in comparatively small part. During the past few years, the very highest authorities have, by abundant tests, confirmed every one of these observations.

If, however, it does not enter the mouth, what does become of the "hauptstrom," the main stream of smoke? And what is its effect on the smoker?

Certainly it is not carried to the brain in the manner described by Dr. Crothers of whom we made mention a little while since. He says: "In the cigarette these poisonous products, small in amount, are constantly taken into the blood-vessels of the mouth and affect the senses." From this remarkable sentence, one would suppose that the senses are affected by way of the blood-vessels, and that there were many poisonous substances in the smoke.

The truth has been stated quite clearly and quite crushingly by Dr. J. S. Gilfillan in the *St. Paul Medical Journal*.* "Recent investigations seem to show," says Dr. Gilfillan, "that nicotine is the only constituent of tobacco present in sufficient quantities in the smoke to produce general effects."

This statement is both candid and accurate, and is therefore worthy of consideration. It will be noted that Dr. Gilfillan speaks of general effects, for every physician with scientific knowledge is aware that the physiological effects of smoking are exerted chiefly on the blood pressure and caliber of the arteries. This has been demonstrated by the experiments of John, who says that the diastolic pressure is raised and the arteries contracted by smoking.†

On this account, Pawinski believed that smoking produced arterio-sclerosis—hardening and thickening of the arteries. On the other hand, Schmiedl, in even more elaborate experiments, was unable to prove a necessary connection. He says "tobacco does not necessarily produce arterio-sclerosis. On what factor arterio-sclerosis depends is as yet unknown to us."‡

So we come at last to the "tobacco heart,"

*July, 1912.

†*Zeitschr. f. exp. Pathologie u. Pharmakologie*, 1913, xiv, p. 352.

‡*Frankfurter Zeitschr. f. Pathologie*, 1913, XIII, p. 74.

and it is well to dispose of that by reference to a man who is at the very head of the medical profession. In his *Principles and Practice of Medicine*, a standard the world over, no less an authority than Dr. William Osler refers to "so-called tobacco heart" and speaks of three kinds; but in this connection he says that "cardiac pain without evidence of arterio-sclerosis or valvular disease is not of much moment." This is interpreted by one of his former associates in Johns Hopkins University, as meaning that "*he seems to doubt that 'tobacco heart' has anything to do with tobacco*, and is convinced that, whatever its cause, it is scarcely dangerous enough to be seriously considered."

*The
"Tobacco
Heart"
Fallacy*

These quotations will show the correctness of Dr. Gilfillan's statement that "the actual harm resulting from smoking is uncertain." Apparently it is not the absorption of nicotine by the blood vessels that is responsible. He says further that "naturally, but a small proportion is taken up by the mucous membranes," and that, "whether it is pure volatilized nicotine or combinations of this base is not certain."

These views should certainly be sufficient to put to rest any doubts about the effects of cigarette smoking. In case, however, any should still linger, I shall conclude by giving two views, each of a decided nature, on the subjects of the cigarette and the voice and air passages, and on the effects of cigarettes compared to other forms of tobacco using.

The first of these is that of Dr. Leonard K. Hirshberg, of Baltimore, who was for years connected with Johns Hopkins University, an institution famous for its medical researches. Says Dr. Hirschberg:

Ordinary smoking produces no perceptible irritation of the air-passages. Indeed, the London *Lancet* has earnestly advanced the view that its effect upon them is decidedly antiseptic and beneficial. *I am convinced that the smoke of tobacco is less injurious to the air-passages than the smoke of any other substance that burns.*

The second of our concluding views—that on the effects of cigarettes as compared to the effects of other forms of tobacco—is from an editorial captioned “The Luckless Cigarette” in the *New York Medical Journal*, of July 25, 1914:

A naughty trick of newspaper reporters is the interviewing of prominent men on subjects which are of universal interest, but which do not necessarily come within the mental scope of the gentlemen interviewed; the trap usually proves irresistible and the flattered victim genially yields up copy by the yard to the advantage of the reporter, but to the occasional promotion of confused thought among readers. Little real harm results as a rule from this practice, interviews being generally confined to such subjects as the tariff, business depression, the ending of war, etc., concerning which one man's opinion is worth as much as another's.

When, however, the interview bears on matters of physiology, pathology, and hygiene, there is a special addition of at least 150,000 medical experts to the popular audience, an addition which usually can only gnash its teeth in impotent fury while the delightfully worded misinformation is spread abroad.

The effects of alcohol and tobacco are frequently chosen for discussion by men who have "succeeded," but who forget the paths along which they have acquired exact knowledge and permit themselves to stray into fields where their opinions are valueless.

The exact physiological and pathological consequences of drinking and smoking are among the most obscure problems of medical science. Particularly do the uninformed, however, enjoy an attack on the cigarette; it is cheap, it is small, and its patrons, numerous as they are, yet form an insignificant minority in our immense population. Therefore the cigarette and its users are fair game for cheap and silly sneers; sneers which are capable, however, of cowering an entire legislature, as in Georgia at this moment. Yet, beyond cavil, *it has been proved scientifically that of all methods of using tobacco cigarette smoking is the least harmful.*

Some months ago the *Lancet* undertook a careful laboratory study of the various ways of consuming tobacco, with the result that it was found that the cigarette, Egyptian, Turkish, or American, yielded the least amount of nicotine to the smoke formed; the cigar came next in point of harmlessness; while the pipe overshadowed the cigar to the extent that from seventy to ninety per cent. of nicotine was said to exist in its smoke. *As to the paper of cigarettes the attacks are simply preposterous.*

It is not without interest to recall that nearly ten years ago, the *New York Medical Journal*, arguing along entirely different lines, came to exactly the same conclusion; but it added that, to say nothing of other obvious drawbacks to his habit, the chewer of tobacco, being continuously saturated with a strong solution of tobacco, was in much worse case than any smoker could possibly be.

So much in behalf of the rational use of the cigarette. Of its abuse I shall speak in the succeeding chapter.

CHAPTER XIII

THE QUESTION OF EXCESS

A Comparison of Excesses of Various Kinds—Moderate Use of Tobacco Not Injurious—Intemperate Eating, Drinking, Working—More Mistakes about Nicotine.

A **“BUSE”** is one of those words which ought to be used carefully but is generally used without any care at all. To say of any given article that its abuse is harmful is by no means to deny that its use is beneficial. Yet, so easily are we affected by the mere noise of whosoever can talk loudly that, if such a talker continues long enough in his condemnation of extreme examples of the abuse of this thing or that, we are prone to take his mere words as proof, not only of the evils of the abuse, but also of the inherent evil of the thing in question. It depends, in the long run, on the persistence of the talker. Many people make nervous wrecks of themselves by overindulgence in tea and coffee, yet there is no popular clamor against those caffeine-laden beverages, and this is so solely because no organized crusade of publicity has been launched against them.

For the same reason, although we know that several ice-cream sodas drunk in succession would be harmful, we are still willing to admit that an occasional one is both harmless and refreshing.

Nor does the matter end when one has said that what is good for the normal man—what

may even be necessary for him in moderation—is bad for him in excess.

The average lay-observer uses that term "normal" as loosely as he uses the word "abuse." He sees a man who seems to him normal, suffering from the use of some article, and not stopping to inquire whether this very suffering is not proof of the man's abnormality, he decides that the article is bad for the normal individual.

That is to say, he does so if—and only if—there has been against the article in question such a crusade of publicity as we referred to a moment ago.

There are subnormal people—thoroughly normal in their appearance—on whose system eggs act as a poison, because the body-cells of these people and their tissue-juices cannot amalgamate the "white," the albumen, of eggs with their serum and lymph; but we have yet to hear of legislation to prohibit the use of eggs.

There are still other persons—also apparently normal—to whom bread is poison; there are still others that cannot eat fish; some are poisoned by parsnips, many by strawberries. Such persons are said by medical men to have an "idiosyncrasy" against the eggs, the bread, the fish, the parsnips or the strawberries, and they avoid trouble by the simple process of avoiding the thing against which they have an idiosyncrasy.

In the same way, there are in the world a few people who have an idiosyncrasy against

tobacco, and the obvious course for them to pursue is to let tobacco alone.

To prohibit the benefits of tobacco to all men because tobacco is bad for a few abnormal individuals is as manifestly unfair as it would be, for like reason, to prohibit bread and strawberries. We are not, however, dealing with the abnormals. For them the warnings of nature or of their family physicians should be a sufficient guide to prevent their indulgence in anything that is injurious to them, or over-indulgence in anything that, if used rationally, would be not only harmless but actually beneficial, whether that thing be tea, coffee, dancing, cake or tobacco.

For all men the proof lies in the trial. What we have here to concern ourselves with is the average man, and for him the medical profession almost unanimously agrees that to smoke tobacco moderately is not injurious. It does more than this. As we have seen, it asserts, with few exceptions, that cigarettes are the best form in which tobacco may be used.

Some evidence along this line we have already produced, but volumes of fresh quotations from papers prepared by leading physicians could still be given to substantiate that statement. Directly to the point, however, is the following extract from an editorial in the *New York Medical Journal*:

Once more we reiterate the statements that in our experience and judgment injurious effects do not fol-

low in any important percentage of people the moderate smoking of tobacco, whether as cigarettes or otherwise; excess in the use of tobacco, as of all other, even the most harmless, things is bad, but abuse is no argument against proper use; cigarettes *per se* are no more injurious than any other form of smoking, and in our belief certainly not so injurious as cigars, since, as the *Lancet* (London) states, such nicotine as reaches the mouth comes principally if not entirely from the moistened tobacco in contact with the lips which is undoubtedly greater in the cigar than in the cigarette; the only special dangers inherent in cigarettes are the temptation to a more continuous use and to the practice of inhalation. There are certain classes of people who should not smoke at all, especially neurotics, the subjects of certain cardiac affections, and those in whom it affects injuriously either the sight or the throat; and, lastly, smoking in any form should be stringently interdicted by parents, teachers, etc., to all youths.

Due regard being had to these principles, we assert once more positively and unhesitatingly that cigarette smoking is not *per se* injurious, and that the mass of sensational newspaper cases ascribing all sorts of horrors to the use of cigarettes are as false as they are puerile.*

The fact is that humanity is given to excess. Beasts over-indulge in nothing; they do not even over-indulge in muscular effort in the pursuit of food; in diet, and in the lapse of time between meals, they follow nature's rules. But we men are all constantly doing things that we ought not to do. Of all the animals, man is the only one that does not live a natural life, and conse-

**New York Medical Journal*. Issue of January 27, 1900.

quently, he is the only one that does not generally die of old age, the natural consequence of the running down of the physical machine.

Man overworks and endangers his muscular system. He almost universally and habitually

Intemperate Eating, Drinking, Working eats to excess and thereby weakens his digestive organs and the cells and tissues of his whole body. Consequently he contracts diseases that bring him to an un-

timely end. The lower animals in their natural state rarely die of disease. In our treatment of domesticated animals we try to see to it that they are provided with the proper food in proper quantities, while we ourselves often eat and drink what we know is not good for us, and consume quantities far in excess of what is required.

To be honest, we lead lives that are largely suicidal. "We die daily" is the way it is put by the *Medical Press and Circular*, an English medical periodical of repute. In an editorial on smoking, in which it comments on the study of the effect of tobacco by J. Pawinski, who has been quoted in another chapter, that journal says:

We eat, and poison ourselves through our colons; drink, and line our arteries with lime; and are merry, with the most disastrous physical results. And, of course, we smoke. We were always told it was bad for us. That is probably why we ever wanted to do it. We are still being told it is bad for us. Not in the simple downright terms of our youth, but now it is the "lambent pupillage of slow, low dry chat" that encourages conviction. * * *

Yet we all smoke, and most of us are apparently none the worse for it, and it is a matter of experience that the smoker who knocks off for a time is not obviously improved in body or temper. So there things stand. *

This is a point worthy of more extended notice, and one on which I shall quote from a few more eminent English authorities. Sir Thomas S. Clouston, whose opinions rank well among all physicians, says:

The use of tobacco has become the rule rather than the exception among the grown men of Europe and America and of some parts of Asia. If its use is restricted to full-grown men, if only good tobacco is used, not of too great strength, and if it is not used to excess, then there are no scientific proofs that it has any injurious effects, if there is no idiosyncrasy against it. Speaking generally, it exercises a soothing influence when the nervous system is in any way irritable. It tends to calm and continuous thinking, and in many men promotes the digestion of food. To those good results there are, however, exceptions. It sometimes sets up a very strong desire for its excessive use; this often passing into a morbid craving which leads to excess and hurt. * * * Tobacco, properly used may, in some cases, undoubtedly be made a mental hygienic.

In the same vein Dr. Jonathan Pereira says: "I am not acquainted with any well-ascertained ill effects resulting from the habitual practice of smoking." Dr. Benjamin W. Richardson, writing in *The Lancet*, of London, to which eminent medical journal we have often had occasion to refer, goes even

**Medical Press and Circular*. Issue of August 12, 1914.

further. He declares that tobacco "is innocent as compared with alcohol; it is in no sense worse than tea." And another eminent English authority, F. W. Fairholt, F. S. A., says in his book, *Tobacco*:

The author's father died at the age of 72—he had been twelve hours a day in a tobacco manufactory for nearly fifty years; and he both smoked and chewed while busy in the labors of the workshop, sometimes amid a dense cloud of steam from drying the damp tobacco over stoves; and his health and appetite were perfect to the day of his death; he was a model of muscular and stomachic energy; in which his son, who neither smokes, snuffs, nor chews, by no means rivals him or does him credit.

Nerve specialists are not lacking in agreement with these opinions, but we shall let one example suffice. Dr. Joseph Collins, a celebrated expert on nervous diseases, in his book on those ills says:

After maturity the moderate use of tobacco, alcohol, tea, coffee is not only devoid of injurious capacity to the individual, but it may assist him in the enjoyment of life and the performance of his duties without in the least jeopardizing or impairing physical or mental vigor.

In the preceding chapter of this book, I cited many noted medical authorities who agree substantially with the above concerning the harmlessness of smoking, especially the smoking of cigarettes in moderation. At this point, I shall record the views of only a few in so far as they deal with this question of excess. In an able article on "The Truth About Tobacco" Leonard K. Hirshberg, M.D., M.S.,

A. B., Johns Hopkins University, of Baltimore, has said:

It is apparent to any one with common sense that, in studying the effects of tobacco on the human system, we must consider healthy adults of normal constitutions. There are people who cannot abide cigar smoke, just as there are people who cannot abide caviar. But such folks are palpably designed by nature to eschew the weed.

Tobacco, alcohol, and weather are blamed for the great majority of all diseases that have no obvious origin. If a man is killed by a fallen derrick, even a mental healer is clever enough to accuse the broken rope, but if he dies of angina pectoris or chronic bronchitis, and his family yearns for enlightenment as to the cause of his malady, your average, old-school family doctor, with a laudable desire to be agreeable at no expense of meditation, will mention cigars and let it go at that. But such a mode of reasoning, to put it mildly, is childishly unscientific. As well say that an ardent pie-eater who dies of gangrene owes his demise to the mortal pumpkin pie. * * *

Hoarseness, which sometimes follows excessive cigar or cigarette smoking, particularly in winter, is to be laid, not to tobacco, but to the general imbecility of the smoker. A man who smokes in the open air when the temperature is at twenty degrees, and thus inhales alternate blasts of hot and frigid air, or begins to smoke before breakfast and keeps his mouth membranes and muscles of suction busy until he falls asleep at night, is certainly not to be regarded as a normal man, and it is unfair to condemn smoking in normal men because this one simpleton happens to be injured by it. If a man talked all day or drank all day or walked all day, he would be vastly more damaged. Again, he would grow hoarse much more

rapidly if he ate snowballs or inhaled wood smoke or stood watching a fire in a hay warehouse.

Dyspepsia and loss of flesh very rarely follow the use of tobacco, and, if the latter may be held at fault at all, it is but indirectly. Whenever the salivary glands are stimulated and saliva forms, the stomach is stimulated also and extra acid and pepsin are secreted. This is nature's method, when food is introduced into the mouth, of preparing for the process of digestion. Now, if the salivary glands are stimulated by something other than food, the stomach does not know this, but goes on secreting digestive acids and pepsin as usual. These things finding no food to engage them, may cause trouble, and the labor of producing them to no purpose necessarily drains the body. So it is apparent that chewing tobacco may cause a "sour stomach," just as chewing gum may do the same thing. However, I am not dealing in this article with tobacco chewing, but with tobacco smoking. There is no evidence whatever that the very slight salivation caused by smoking injures the stomach in any way.

The nervous headaches, neuralgia, and dizziness commonly laid to smoking are fantastic creations of extra-moral minds. In all the literature of medicine there is no proof that tobacco ever caused any of these diseases. I have no doubt that, in a man prone to dizziness, a cigar may bring on an attack, but, at the risk of tiresome repetition, let me submit again that it is manifestly unfair to condemn tobacco because it does not agree with invalids. There are plenty of sick people who cannot eat roast beef, and there are plenty of well people with a mysterious individual antipathy to other things. But we must leave out diseased conditions and idiosyncrasies when we consider the effect of tobacco upon the normal, healthy man.

The same mistake has been made in condemning smoking out of hand because of its obviously pernicious

cious influence upon children. Let us admit, for the sake of argument, that cigarette smoking is a bad practice for small boys. Does that prove anything regarding its effect upon grown men? I think it only fair to answer in the negative. * * * Ten cigarettes a day may injure a boy of twelve, but that is no argument against ten cigarettes a day for a man of thirty-five. *

Another well-known physician who has spoken his mind on this matter of tobacco temperance is Donald McCaskey, M.D., member of the staff of the General Hospital of Lancaster, Pennsylvania, and Fellow of the New York Academy of Medicine. In one of his articles for "The Doctor's Helps," a widely syndicated newspaper feature, Dr. McCaskey, after deprecating the immoderate use of cigarettes, says:

I do not believe that any occasional cigarette, smoked either by man or woman is at all harmful, any more than do I believe that an occasional game of cards, at which the parties are thoroughly enjoying themselves is harmful. It all depends on the attitude of mind, and the condition under which the habit is carried on.

We now come to the opinion of an expert whose position for years brought him in contact with wretched human beings suffering the tortures of practically all the excesses man is heir to. He is Dr. F. W. Robertson. His excellent service as head of the psychopathic department in Bellevue Hospital, New York, made him widely known and his conclusions

**Harper's Weekly*. Issue of January 4, 1913.

respected; and he goes on record concerning cigarettes with the following:

I have been something of a student of cigarettes, and it is my belief that they offer the mildest and purest form in which tobacco is used. A cigarette is made from the finest bright Virginia tobacco, which contains only one to one and a half per cent. of nicotine against six to eight per cent. in the average cigar. I have looked carefully into the analyses of cigarettes and cigarette paper, made at different times, and it is my conviction that injurious results do not follow their use.

It is agreed, as hinted above, that the only possible harm that might result from over-indulgence in tobacco must come from the nicotine that is a natural component of all tobacco; but man very quickly immunizes himself to the effects of nicotine. On this point, I again quote from an article by Dr. Hirshberg:

The small boy, when he tackles his first cigar, becomes violently ill. But his second cigar gives him less discomfort, and his third still less. By and by he becomes entirely immune, and in the end smoking becomes his solace and earthly reward, and nicotine has no more effect upon his internal economy than so much mayonnaise dressing or vegetable soup.

It is this capacity of the human body to immunize itself against poisons that makes the animal and other experiments of the foes of tobacco so silly. Yellow fever, as every one knows, is a horrible and deadly disease, and yet a man who has once had it may regard it ever after with the calm indifference with which an ordinary man regards a shave. * * *

The man who has learned to smoke, and, in consequence, has gone through the small boy's experience of mild poisoning, is immune thereafter, and may take into his system daily the small quantity of nicotine which lies in tobacco smoke without the slightest qualm or fear.

From this it logically follows that a man may safely smoke a much larger amount of the kind of tobacco that is manufactured into cigarettes than that which is used for smoking in other forms, because of the very small amount of nicotine in cigarette tobacco. As stated on quoted authorities in this book, the quantity of nicotine in cigarettes is negligible, being on an average little more than one per cent., while cigars and pipe tobaccos often contain five per cent.

*More
Mistakes
About
Nicotine*

There is more than five times as much tobacco in an ordinary cigar as in a cigarette. Therefore, so far as nicotine is concerned, a hundred cigarettes equal practically four cigars. Thus it stands to reason that the man who smokes fifteen cigarettes a day—which perhaps is above the average number consumed by the average smoker—has no concern about nicotine, to which, at all events, his system is immune.

Really, it is not nicotine that makes "a good smoke" any more than it is the bone that makes a good beefsteak. It is true, some smokers have a notion that it is the amount of nicotine in tobacco that counts, that makes a certain tobacco enjoyable or not as the case may be, and such smokers believe that, there-

fore, they must look for supreme satisfaction in the stronger forms of smoking. But these men are mistaken. Nicotine is not the part of tobacco that has to do with flavor, aroma or burning quality, and it is only the flavor, aroma and burning quality that count.

And now one word more and I have done with this phase of the cigarette question.

From my quotation of the foregoing authoritative statements, no reader will, I trust, conclude that I am trying to condone the excessive use of cigarettes. Far from that. It is true that over-indulgence in tobacco is bad for the human system, but so is excessive eating of food, drinking of tea and of coffee, excessive dancing, or overwork.

To all such excesses I am opposed. But I do believe that an irrational use of tobacco is less harmful than excesses of any of the other ordinary kinds; that temperate indulgence in tobacco is not only harmless, but actually beneficial to normal men; and, lastly, that cigarettes as manufactured today, are the best form in which tobacco is used.

CHAPTER XIV

THE CIGARETTE IN WAR

Tobacco Proved to Be a Necessity to Armies in the Field—
Revelations by Motion Pictures—Solace for Men on
Destroyer Fleets—Bond between King and Soldier—
Appeals of Men on Firing Lines Lavishly Met—Gov-
ernments Pass Gifts of Cigarettes Duty Free—Test
of Valor in Mexican Battle—Favorite Smoke
in Army and Navy—Remarkable
"Titanic" Spectacle.

I HAVE promised a word on the cigarette in war, and I am now about to keep that promise. It was made because war is certainly the most trying of all ordeals, mentally and physically, to which the human organism is likely to be subjected.

It was my purpose to show that the relaxation furnished by tobacco is necessary in times of great stress, and that the form in which that relaxation is absolutely certain not to degenerate into a reaction is the cigarette. The proof of this thesis is, it seems clear to me, furnished by the medical authorities of contending armies when they permit, and even encourage, cigarette smoking by those fighting soldiers whose health and energy are so largely in their care.

Apart from all discussion of the issues directly involved in the great European War that burst upon a startled earth in August, 1914, one of the surprises of that tremendous conflict was a world-wide realization of the value of the cigarette in modern warfare.

Smoking, and especially cigarette smoking, was proved to be essential to the comfort of the soldiers and stimulating to their valor.

The part that the cigarette plays in the welfare of those soldiers was brought out forcibly at the beginning of hostilities and has resulted in a complete change of opinion on the part of most people who thoughtlessly condemned cigarettes before this conflict of nations began.

Cigarettes have determined the outcome of battles. By the simple act of lighting cigarettes, the men who compose the rank and file of armies have at crucial moments been nerved to deeds of daring that were destined to decide the fate of a campaign and the fortune of a war.

The spectacle of a single man smoking while bullets were singing their songs of death about him has determined the issues of a contest and accomplished the downfall of a government. In times of grave danger men have resorted to the solace of the cigarette to gain that confidence which carries the bravé to victory. Under unusual strain, in tense situations, where human life has been in the balance, fellow workers, suffering from utter exhaustion, have, after puffing a cigarette, returned to their task with renewed vigor and succeeded where, a moment previous, they faced failure.

That the cigarette is a requisite of an army in the field is admitted by men in all walks of life. Consequently, we now see every ef-

*Cigarette
a Necessity
to Armies
in the Field*

fort bent, in these anxious times, to supply the men on the fighting lines with the paper-rolled tobacco from which they seem to gather that reserve and daring which make their charges in the armed European camps unparalleled in the annals of war.

This has been demonstrated more than once in France, Belgium and Poland, where gigantic armies struggle desperately for days to capture a trench or advance a few rods against an adversary. Millions of men engage in the most awful onslaughts and most stubborn resistances the world has ever known, one side keyed up to reckless enthusiasm, the other to dogged defense along hundreds of miles of battle-front; and in this titanic conflict the cigarette is reckoned a formidable factor.

Emphasizing the part cigarettes play in this world war and the recognition by belligerent governments of the necessity of having a constant supply for the soldiers, hundreds of American newspapers have published thoughtful eulogistic editorials on the subject. We select one from the Lynn (Mass.) *Evening News*.

THE CIGARETTE IN WAR

Scarcely a week goes by in this country or in any part of Europe but that there is an appeal from some organization for tobacco for the soldiers, and especially for cigarettes. In Berlin receptacles were placed in the streets into which such contributions might be placed. In Paris and London other methods of collection have been employed, but the same urgency of appeal has been felt. To this country general appeals have come, and also a number of

special appeals for the same thing. The soldiers, we are told, must have their tobacco; the cigarette is the handiest form in which this can be sent; therefore contributions of cigarettes are asked for in the name of humanity and patriotism.

The appeal has been answered, too. The number of "smokes" sent to the front has been enormous, and shipments still continue, and are likely to do so as long as the war continues.

The small boy, however, should not imagine that this means that the whole world has come all at once to look upon the cigarette as one of the greatest things in the world, and that he himself will be allowed to take up the habit in peace. Cigarettes are just as bad for small boys as ever.

The case of the soldier on service under modern conditions is very different. Nothing can well be more trying to the nerves of men than such service as millions have been giving in turn in the trenches. The noise, the suspense, the discomfort, are extreme. Unless men have something to soothe the nerves somewhat, to deaden the loneliness, there is more than a chance that the death list will mount from other reasons than wounds. The cigarette is a neurotic and is so regarded by the people who are so urgent in sending them to the front. Whatever may be the effect under normal conditions of living, they help soldiers at the front to endure the strain. All anti-cigarette crusades must recognize this fact and be governed accordingly.*

Correspondents at the front, sending home such facts, might conceivably write from a prejudiced point of view, but we have one essentially modern witness whose testimony cannot be impeached. We have the motion pictures.

*Lynn (Mass.) *Evening News*. Issue of January 5, 1915.



Photo. from Underwood & Underwood



Photos. from Brown Bros., N. Y.

SOLACE FOR WOUNDED SOLDIERS

Cigarettes have played an important part in the European War as comforters of the wounded. At the top is shown a German officer lighting a cigarette for a wounded Russian soldier who sought shelter in a hole dug by an exploding shell during a battle. Below a French officer is distributing cigarettes to wounded British soldiers. While the Belgian clergyman in the third picture prefers a cigar, the wounded soldiers cling to their favorite smoke, the cigarette.

Motion picture scenes in different portions of the war zone depict the almost universal use of the cigarette by the men under arms. In the Belgian pictures, taken under the auspices of the *Chicago Tribune*, part of the proceeds from the exhibition of which goes to the relief of the people of that devastated country, one gains some idea of the extent to which the cigarette is distributed among the men.

*Revelations
by
Motion
Pictures*

In one of the scenes, for instance, a strip of the Belgian firing-line appears, in the very center of which a man is seen calmly puffing a cigarette. Another picture shows a little girl, almost surrounded by soldiers who smilingly accept the cigarettes she offers them. Some tuck the gifts behind their ears, others immediately light them, and one, in order to get more than his fair share, roguishly passes the little girl several times.

Similar scenes occur in other motion picture exhibitions given under the auspices of the *New York World*, the *New York Evening Sun*, the *New York Staats-Zeitung*, the *Chicago Herald* and other newspapers. They have all been caught by the camera that does not lie. Of the many weekly war "releases" in the motion picture theatres, one rarely is seen where officers or men are not smoking cigarettes.

One of the most striking of the ordinary photographs to come from the front is shown in the *New York Sun* of November 1, 1914. A body of Belgian troops pass through a town, the sidewalk lined with people watching a man

handing cigars and cigarettes to the horsemen as they ride by. The wistful glances of the soldiers as they catch sight of the large box that this benefactor extends, indicate their anticipation of the comfort these "smokes" are going to afford them later on.

Of a not dissimilar appeal is a half-page picture published in *Collier's Weekly*. It is an enlargement from a snap-shot made inside the German lines, and it shows the German Crown Prince, his arms folded at his back, contentedly smoking a cigarette as he watches a maneuver of the army. Nor is the royal personage by any means the only one in that photograph who is addicted to the use of tobacco in this form so popular among the fighting men of Europe.

Photographs of women entering the trenches in Flanders to distribute cigarettes to the soldiers have been printed generally in the Sunday war supplements of the larger newspapers of the United States. One, a splendid reproduction, published by the *New York Times* of December 13, 1914, shows a group of French infantrymen who have halted on one of the wet roads in Belgium to light their cigarettes.

Again and again have hundreds of these fighting men gone to death with cigarettes between their lips. One positively striking example is furnished us when we turn from the land battles to the sea war. Illustrating the manner in which the cigarette buoys one up in the face of certain destruction, the *New York Globe* comments as follows on the



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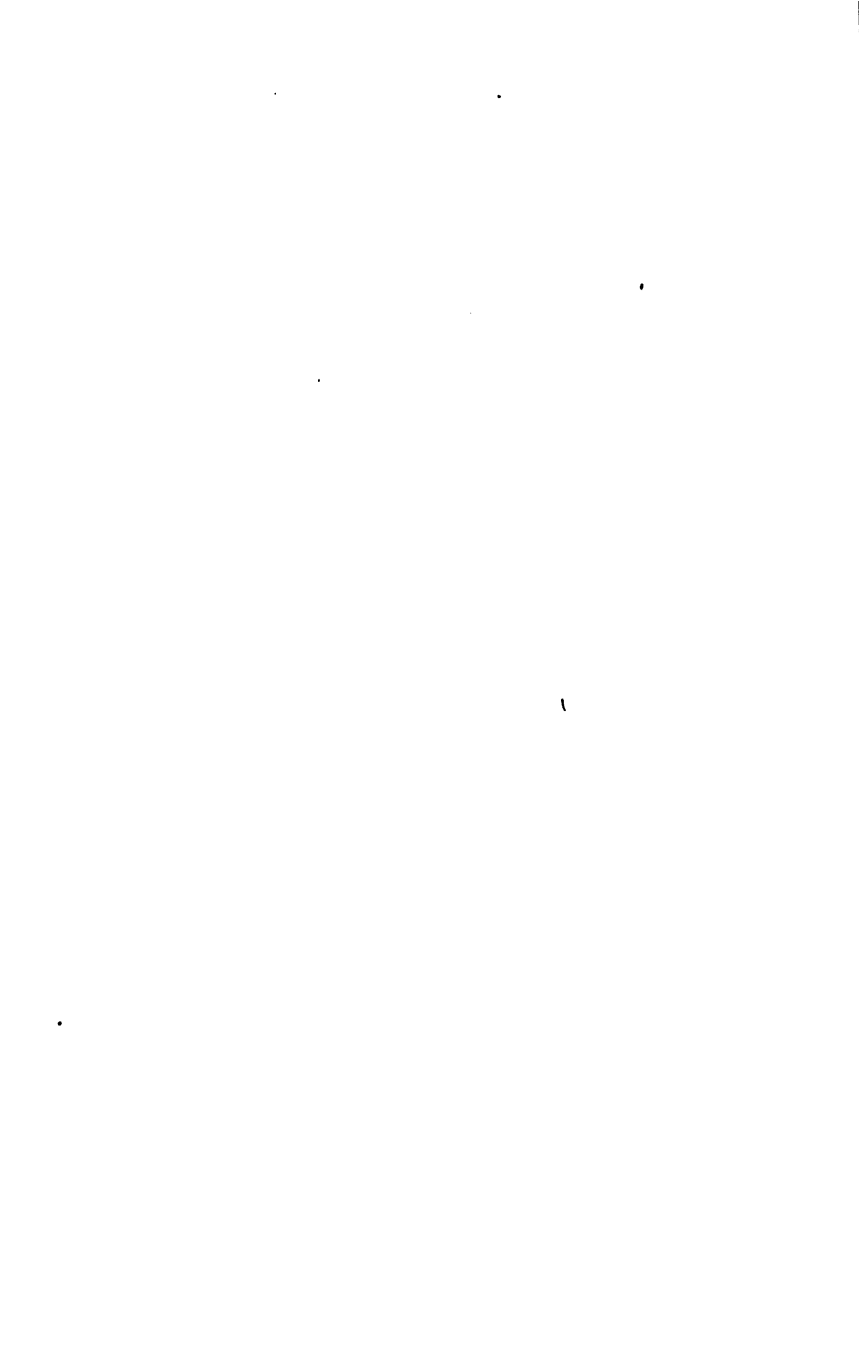


Photo. from Brown Bros., N. Y.

Photo. from Paul Thompson, N. Y.

CIGARETTES OF ROYALTY AND THE RANKS

In the top picture the German Crown Prince (second from the right) is shown resting after a battle. All of his aides are enjoying cigarettes with him. Below, at the left, a wounded Frenchman shares a light with a "London Scottish" comrade. The picture at the right indicates that Italian soldiers enjoy their cigarettes as much as the men of the other warring nations.



loss of the British battleship *Formidable*, after being torpedoed by a German submarine:

THE CIGARETTE OF COURAGE

Captain Loxley of the *Formidable* went down with his ship, standing on the bridge calmly smoking a cigarette. A survivor of the disaster tells how he rushed up on deck, borrowed a cigarette from one of his comrades and a light from another, and then dashed below again to get more cigarettes. We often hear also of other heroes who go to their doom lip-ping a cigarette between their teeth. It never is a cigar or a pipe, but always a cigarette.

In moments of severest tension few men can preserve a complete semblance of composure and control without something to finger or munch, some little means of muscular occupation, of nervous discharge. Talleyrand, the classical example of the undismayable, had no need of a cigarette between fingers or lips, but his *sang-froid* is said to have been literally physical, derived from a pulse down in the forties.

A singer facing the dread ordeal of a new public may handle a piece of music to which he never refers, a slip of paper bearing words, or, if the singer be a woman, a fan or a flower. The men dying for country and faith are going to death with the solace of the cigarette. A neat revenge that makes this snare of youth a white badge of courage.*

Cable messages telling of the sinking of the *Formidable* describe in detail the last moments of members of the crew of the sinking ship, when the lifeboats pulled away. There was no excitement, no clamor, no appeal for aid, no last words, no fear among the stout-hearted men whose lives were to be calculated

*New York Globe. Issue of January 5, 1915.

in minutes. As though they were preparing for a lawn fête, they brought a piano on deck, played ragtime, sang, and, following the example of Captain Loxley, blew the fragrance of their cigarettes into the face of death.

Cigarettes were their solace in the supreme moment, when they stood the test for which their training had prepared them. It was only when the wounded fighting ship, in the final throes, lurched beneath the icy waters of the English Channel that the cigarettes were extinguished—with the lives of the men.

As these tars died with their cigarettes, so others have been saved with theirs. When the survivors of the British dreadnought *Audacious* were taken aboard the liner *Olympic* after the explosion which wrecked that great floating fortress, one strange fact was observed to be common to nearly all of them. With scarcely an exception, every man Jack among them had a cigarette tucked behind his ear. They had lost their ship and practically all of their personal belongings—but they had saved their paper-rolled tobacco.

Indeed, the cigarette is especially necessary to these fighting sailors. On the torpedo-boat destroyers of the contending navies the Jack tars are on the verge of nervous prostration at all times. The boats are so light, the machinery so strong and powerful, and the pounding of the engines maintains such a harrowing vibration throughout the framework of these wasps of the sea, that the crews are brought to the verge of collapse after a few days. Aboard the great battleships there is less "give" to the

framework, and there the strain on the men is not so great; but on the destroyers, with machinery running at high speed day and night, the strain is described as almost unbearable. After a week or ten days the nerves of the men on these boats go to pieces, and they are transferred to the larger, steadier vessels of the fighting line.

When the flesh of the men of the destroyer fleet shakes like jelly, and their nerves jump, and they start at any unusual sound, it is the cigarette that often restores them to something like normal; that slows down the feverish beating of nerves that try to keep pace with the rapidly revolving crank-shafts of the fastest boats ever designed by the genius of man. The cigarette restores them, revives them, and enables them the better to withstand the succession of shocks that are imparted to their vessels by the thousand, while every hour the machinery spins madly to drive this scouting fleet through the fog-shrouded waters of the English Channel, in the black night at the mouth of the Dardanelles, the strong light of the Black Sea, or the soft haze that hangs over the historic Adriatic.

*Solace for
Men on
Destroyer
Fleets*

To return, however, to terra firma. Once more treading dry earth with the warring armies, we find there the same devotion to the cigarette and the same comfort derived from it that we find afloat. Reference has already been made to men smoking in the face of death ashore as well as at sea. Instances are many

in the present conflict, but one will serve. It is taken from the *Chronicle* of Quebec, Canada, which published the following in a collection of extracts from letters written by Canadian troopers at the front:

Sergt. A. Bowler of the Fifth Signal Troop, R. E., pays this tribute to Gen. Sir Philip Chetwode: "I have watched him calmly smoking a cigarette when shells have been dropping all over the place. I think that if all the German Army were firing at him he would carry on as usual, smoking his cigarette and giving his orders as if he were in his club ordering a drink."*

These things make men brothers. Early in the war it was no uncommon event at the Western front to see the Belgian King, who appreciates the value of cigarettes, hand his to the soldiers, and accept theirs in return. He often visited the trenches, where he spent hours smoking and talking with his men. But not long after the beginning of the war the impoverished Belgian people could no longer send tobacco or cigarettes to their fighting men and their suffering by reason that they had always been great smokers became intense from the lack of tobacco. Almost unanimously they appealed to the Minister of War to "give us worse food if you like, but let us have tobacco." Hearing their appeal, a movement known as the Belgian Soldiers' Tobacco Fund was started in the United States and a large sum of money raised

*Issue of March 18, 1915.

with which to send a continual supply of fifty cigarettes and some smoking tobacco to each of the approximately 200,000 Belgian soldiers as long as the war lasted.

We have seen the Crown Prince of Germany smoking under fire. Looking through the newspaper files we soon find a reversal of the old proverb and are tempted to say not "like father, like son," but "like son, like father," for the Kaiser seems to share with his heir the habit just noted in one of his gallant enemies. A cable message from London to the *New York Times* under date of March 6, 1915, says:

The *Daily Mail* quotes the *Hamburger Nachrichten* as saying that when the Kaiser was on the western front he dropped his handkerchief and an infantryman picked it up. The Kaiser gave him some cigarettes and the man said:

"Thank you, your Majesty." Thereupon the Kaiser said:

"Oh, you need not call me your Majesty. Here you can simply address me as comrade."

Another infantryman in the neighborhood heard this and promptly called:

"Comrade Wilhelm, suppose you give me some, too?"

The Kaiser laughed and handed over the rest of his cigarettes.

From the trenches in Northern France, where the British soldiers find the French tobacco too strong for their taste, the constant appeal of Tommy Atkins to his friends at home has been for "fags," as he calls the Virginia cigarette which is so popular in England. In

the war hospitals, his wounded fellow-countrymen show the same desire, for the "fag" is the short smoke that restores peace of mind and calms the nerves in trying times. Remembering this, relatives send a constant stream of cigarettes to the trenches and hospitals, but when it is considered that millions of men are engaged in the struggle, nobody will be surprised to learn that the supply is inadequate.

Moreover, the need of one army or one navy is the need of all. The Germans, according to a dispatch in the *New York Times* of December 22, 1914, ordered the people of Ghent to furnish, among other things, 1,000,000 cigarettes for the army occupying that town, for Christmas. A little later—in mid-February, in fact—during the coldest weather of that cold winter, German soldiers on the western front received as regular daily rations two cigars and two cigarettes, or an equal amount of chewing, snuff or pipe tobacco.

With a like appreciation of the desires of the men in the trenches, the French colony in Mexico sent thirteen tons of cigarettes to their countrymen who were resisting invasion during the early stages of the war. So great, indeed, has become the demand for cigarettes that the war relief associations representing the various belligerent powers receive and forward them to the men on the firing lines without expense to the donors.

So great is the demand among the men that many have written home for cigarette paper, in order that they may have the "makings," util-

izing the tobacco distributed to them from day to day, preferring such cigarettes in the absence of the better liked and handier ready-made kind, to pipes and cigars they obtain more readily.

On the other hand, rolling cigarettes for relatives and sweethearts in the trenches is an occupation engaged in by many London society women. They commenced their work in order that the soldiers might have a plentiful supply for the first Christmas at the front, in the belief that the man behind the gun would prefer those fashioned by the women who daily prayed for the success of their arms and the safe return of their dear ones.

It is not an uncommon sight to witness women making cigarettes in the lounge rooms of London hotels, and in many cases they have abandoned knitting, in order to provide for the rank and file the "fag" so greatly appreciated by England's fighters. These home-made cigarettes lack symmetry, and do not fit in boxes and cases as do the well-known American brands, but when the latter cannot be had these makeshifts are appreciated by the men in the thick of the fight, especially because they are made by tender hands.

To all the appeals of the soldiers for tobacco Americans have made a more than generous response. To take but one case in point, the Westchester County (N. Y.) Chapter of the Red Cross Society, for the Irvington and Ardsley-on-Hudson Auxiliary, is reported to have sent 10,000,000 cigarettes to

*Appeals of
Men on Fir-
ing-Lines
Lavishly Met*

the armies in Europe. Other associations in various parts of this country have been quite as liberal. Scores of relief organizations joined in the movement. People who themselves may not be partial to cigarettes now recognize and hasten to supply the needs of the men at the battle fronts, and hundreds of unknown individuals make monthly or weekly donations. Among the most generous and most frequent contributors to the Belgian Soldiers' Tobacco Fund mentioned earlier were women and girls.

That the governments constituting the Allied Powers recognize the necessity of providing tobacco and cigarettes to the soldiers on the firing line is indicated by the official arrangements that speedily were completed to pass all gifts of tobacco, including cigarettes, to the battle zone duty free. The generous response of the American people to the appeal for cigarettes has resulted in the forwarding of them by tens of millions.

The Over-Seas Club, a British organization with a membership all over the world, sent more than 100,000,000 cigarettes and over 200 tons of pipe tobacco to the British and colonial troops during the first year of the war.

The German Government recognizes the part tobacco plays in steadying the nerves of the Imperial soldiers, by the generous manner in which issues are made from day to day, while in Austria-Hungary the soldiers get constant supplies direct from the Government. Germany, moreover, admits free of duty all tobacco, including cigarettes intended for the

soldiers of the fighting-line and those in the hospitals.

Cigarettes and other forms of tobacco are admitted free of duty into Turkey, if intended for the soldiers, when consigned to the Ministry of War, the General Administration, or the Turkish Red Crescent at Constantinople. Shipments of tobacco and cigarettes intended for soldiers in the Austro-Hungarian armies are also admitted duty free.

From all this it would seem as if there could no longer be any lack of tobacco among the troops at war. In spite of all gifts, however, and in spite of the fact that all the Governments at war have included cigarettes and other tobacco in the regular rations of the men, the demand still continues far to exceed the supply. Belgium has not been able to give tobacco to her men, so the soldiers must depend on outside help for their cigarette solace.

The benefit derived from tobacco by soldiers in times of great stress and excitement is well known among the trade journalists who have for half a century been gathering statistics on the subject, and in this regard the comment of *The Tobacco Leaf*, a New York paper established fifty years ago, may be considered authoritative:

THE WAR AND THE CIGARETTE

At first blush it is inconceivable that there could be derived from the bloody conflict across the sea any benefit to anyone; certainly none to the tobacco trade. Yet it can be said, perhaps, that this war has done more to establish the reputation of cigarette smoking among the attributes of rugged masculinity than any other conceivable event.

Slowly for a decade past the curious fancy that the cigarette was a caprice of the small boy and the dissipation of the dude has been giving way to the real truth, which is quite contrary.

But since the beginning of the war the cigarette has fairly leaped into its legitimate position as the smoke of manly men.

Reporters on the battle front describe how Sir John French, British Commander-in-Chief, smokes cigarettes throughout his busy day. Stories and pictures of "Tommy Atkins" reveal him with a cigarette between his teeth, on the firing line.

A Red Cross Society has shipped 10,000,000 cigarettes to the allied troops as "a measure of relief." German soldiers have been depicted smoking the inevitable cigarette while executing the gymnastic goose-step. Robert Dunn, war correspondent of the *New York Evening Post*, tells how prisoners within the Austrian lines were willing to trade their buttons for cigarettes.

The army aviators in the sky, the sharpshooters in the trees, the army scouts behind the haystacks—everybody in the great struggle, from the crowned heads of the nations down to the privates in the trenches—are shown as cigarette devotees.

In fact, wherever the bullets are thickest and wherever the tasks are the most dangerous, cigarettes are seen pictured and reported.

This is no revelation to the tobacco trade, but to the general public it is a convincing argument in favor of the real character and standing of the little paper rolls.

The war has done nothing to promote cigarette smoking, but the demand of the public for war news and the enterprise of the daily press in supplying it have been the means of placing the cigarette in a new and true light before the public eye.*

**The Tobacco Leaf*. Issue of December 31, 1914.

One more word of the war in Europe and then we have done with it. We have already seen how the fighting governments have recognized the beneficial effects of the cigarette. It is of high significance that, although all of those governments officially either prohibit or discourage the use of liquor, they encourage the use of cigarettes, and tobacco in all of its other forms.

There has been, however, another war raging, the war in unhappy Mexico, and there, too, the cigarette has been prominent on the firing-line. John Reed, journalist and war-correspondent, lecturing before the Round Table at Columbia University, New York, told of the influence of a cigarette at the battle of Torreon, in that conflict. The rebels, under General Villa, had repeatedly charged the federal stronghold and had been repulsed with great loss. The position of the assaulting party was not advantageous. Huerta's troops occupied the hill, across which stockades or barricades barred the advance for the Constitutional army. Each advance was swept back by a storm of shell. At last Villa, laughing, said:

*Test of
Valor in
Mexican
Battle*

"I'll lead the charge myself this time. Come on."

Calmly, he lit a cigarette, picked up a bomb and started up the hill. He turned his head, inhaled the smoke, blew it out as coolly as though conversing with a friend in the *patio* of his own home, and, with his face wreathed with the ingratiating smile for which he is

noted, nodded to his men to follow him. In an instant the army that had been repulsed so many times was at his back.

How Villa escaped death in that storm of shot and shell no one knows; but, still laughing, talking and smoking, he walked steadily to the fortifications at the top of the hill. Huerta's men, after vainly endeavoring to hurl back the troops, watched for a moment the rebel commander as though his life were charmed, then raised the cry:

"Francesco Villa is coming!"

An instant later, Villa, applying the light of his cigarette to the fuse of his bomb, held it until it burned close to the shell and then, tossing it over the wall, at the head of his men led the charge that resulted in the capture of Torreón and the utter defeat of the federal forces in the battle that opened the way to Mexico City.

It was the most important conflict of the revolution, and the sight of the rebel chieftain contentedly smoking a cigarette while shells were bursting about his head, was what turned defeat into victory at a moment when the spirits of the Constitutionalists were at lowest ebb. Villa, who is nothing if not a student of human nature, planned the simple expedient of bringing the cigarette into play at the last moment—staked all on it—and won the most decisive victory of that war.

In both the army and navy of the United States tobacco has always been officially recognized as a necessity for the men in the service; and ever since, back in the sixties,



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DUCA DEGLI ABRUZZI AND MAJOR GENERAL GOETHALS

Duca degli Abruzzi, noted explorer and Commanding Admiral of the Italian Navy, prefers the cigarette as a form of smoking. The famous United States Army engineer whose genius is responsible for the completion of the Panama Canal and made him Governor of the Canal Zone, is an almost constant smoker of cigarettes.

the manufacture of cigarettes began in this country, they have been supplied to our soldiers and sailors alike.

Indeed, the cigarette may be said to be the favorite form of smoking of both officers and the men under them, and it is considered as necessary as flour or any other staple supply to the commissariat and canteen of all barracks in all army headquarters and on all ships in the navy. At every officers' mess on land and sea the cigarette is enjoyed.

*Favorite
Smoke in
Army and
Navy*

Men grow gray and grizzled in the service, still clinging to the cigarette of their cadet days in West Point or Annapolis, and it is a well-known fact that no men age more slowly or more sturdily than the cigarette smokers in our fighting forces, which perhaps may be considered food for reflection by anti-cigarette crusaders whose stock argument is that the smokers of cigarettes die young.

Even in the construction of the Panama Canal, under the supervision of our War Department, the cigarette played its part. Not only is General Goethals an habitual user of cigarettes, but he recognized their usefulness as a comfort to men under him, and their necessity in maintaining efficiency. The Government laid down rigid rules for the preservation of the health of the canal workers, and cigarettes were a part of the regular supplies.

Japan goes even further in this particular. Its Government is famous for the care that it takes of its soldiers, and for the brilliant re-

sults of that care. The men of the Japanese army are accounted physically the best soldiers in the world, yet the Government makes cigarettes a part of their regular rations in times of peace as well as in times of war.

In fact, the cigarette is now recognized as a necessary supply in the armies and navies of all the great powers on earth. Finally, the cigarette in the present European war has, as I said a short time since, brought about a remarkable change in the attitude of many minds. Whereas we were inclined to look upon it heretofore simply as a luxury and comfort to men of high and low stations alike, this conflict has revealed it in the light of an actual necessity.

However, it is not only in war or among men of war that the cigarette nerves men who face great danger. One notable and tragic instance was in the sinking of the *Titanic* in mid-Atlantic. It will be remembered that the members of the crew, down to and including the bellboys, remained at their posts of duty until the boats had put off and the order was given for every man to take care of himself.

Probably all of those who were left on the fated ship knew they were soon to drown. It was a moment when, ordinarily, a horrid panic might be expected. But nothing of that sort happened on the *Titanic*. The little bellboys, at the word of command, darted about the sinking liner among the passengers for whom there was not room in the lifeboats, and

lighted their cigarettes, which were straightway puffed with a reckless disregard for death. The engineers and the stokers clambering upward witnessed this remarkable spectacle when they reached the upper deck, while passengers in the boats that were pulling away to get beyond the suction of the great vessel when it made its final lurch looked back in amazement.

As it was on the *Titanic*, so it was in the days of our Wild West with the cowboy who maintained life and law and order on the frontier when the Indian was a disturbing factor, or when organized bands of cattle thieves raided the ranges. Then as now, a case of "nerves" was effectively controlled by the lighting of a cigarette, which was serenely puffed while keeping a watchful eye for an enemy.

In any time of great danger, distress or difficulty, when disastrous results seem inevitable, it is not unusual for a man to light a cigarette, from the smoking of which he regains that calm and self-poise that enable him to arouse the determination necessary to record victory—be it in the business of peace or the business of war—where, a moment since defeat has seemed a certainty.

CHAPTER XV

THE CIGARETTE AND THE YOUTH

Inborn Desire in Every Male Human Being to Smoke Something—The Matter of Inhaling Smoke—One Good Reason Why Boys Should Not Smoke—Mistake to Link Crime with Cigarettes.

I DO not believe that growing boys—or girls either—should use tobacco in any form. To say that tobacco in moderation is beneficial to the average mature man—and to say that the cigarette is the best form in which tobacco can be used—is one thing. To advocate the use of tobacco by children is quite another.

Just as there are certain foods which, though necessary to the physical economy of the adult, are properly denied to the small boy or girl, so there are other substances helpful to the grown person which, properly, should be forbidden the person whose growth has not yet been attained. Among these latter, I, for my part, place tobacco.

My own boy has now reached the age when lasting habits are easily formed. That is the age when there naturally arises in him the desire to imitate his elders by smoking. Realizing this, I persistently urge him, as well as all other lads over whom I believe I may have some influence, to refrain from the use of tobacco during their tender years, and quite as persistently—and for the same reason—do I advise them to refrain, for the same period,

from too much meat and from the use of strong spices, cocoa, tea and coffee.

Although I have long been a smoker—first of cigars, then of pipes and latterly of cigarettes—I have never lost this feeling that it is not the part of wisdom for a growing boy to smoke. Perhaps I am thus inclined because I myself, despite all the contrary temptations of school and early college days, refrained from smoking tobacco until I was twenty-one. That is not self-laudation: it is the result of training, for the belief that it is bad for boys to smoke was handed down to me by preceding generations, from forebears none of whom, so far as I can recall, ever used tobacco in any form.

There was, in my case, an especial ban placed upon the tobacco cigarettes, and so I did not smoke them; yet—and this I write in no trivial mood, but as a serious statement bearing upon the broad subject in hand—I hasten to record that I did smoke corn-silk, dried apple-leaves, cubebs, pennyroyal, rattan, and pieces of grape-vine.

I say that I make this confession seriously, for smoking by boys—or rather the sort of smoking that they do—is a serious matter. It would seem that there is in every male human being an inborn desire to smoke something, a desire that in most of us manifests itself at a very tender age. I believe that few normal boys ever grow to maturity without smoking some substance, or trying to do so, and therefore the kind of

*Inborn
Desire to
Smoke
Something*

smoking that a boy first indulges in is of no small importance.

If this is correct, there is at least one thing to be said in favor of the boy's corn-silk or apple-leaves as opposed to the tobacco cigarette: it is more than doubtful if any lad ever contracted the habit of smoking them.

Therein, it seems to me, is one of the best arguments in favor of delaying tobacco smoking until maturity, for the tobacco habit is easily formed, and the fragrant "smoke" is more apt to be indulged in to excess by the youth than by men that are fully grown.

Although there is not an authentic case on record where rational smoking injured anyone, it is, as we saw in the preceding chapter, a recognized fact that excessive smoking is unwise, and boys, whether from bravado or some other cause, are very apt to fall into excessive smoking, when once they have begun to smoke.

I have said that I first smoked cigars, then pipes, and lastly cigarettes. This record of a rather unusual succession of the forms of smoking may be misleading. Some of the unthinking anti-cigarette crusaders might even seize upon it as proof that the cigarette is the only thing strong enough to take the place of the pipe, whereas, as we now know, cigarettes are really the mildest form in which tobacco is used.

I therefore hasten to say that, personally, I do not place credence in the popular belief about a confirmed tobacco habit, and that it

has never been a hardship for me to stop smoking when, or as long as, I pleased.

Now, since practically all the best authorities agree that cigarettes are the mildest and least harmful form of smoking, my experience certainly belies the belief that smoking engenders a craving that calls for increasing strength of tobacco; for, whereas I began with the strongest forms, I have come to abide by the weakest. I get all of the comfort I desire through this mildest form of smoking, and I get it without inhaling.

This brings me back to the question of tobacco and the youth. This matter of inhaling is another of the good reasons why young boys should not smoke. They are too apt to inhale to excess because they think it is "smart," whereas one who begins smoking after maturity learns more rationally, and if he does inhale is not so likely to do it excessively.

*The
Matter of
Inhaling
Smoke*

To repeat, then, I am opposed to smoking on the part of growing boys. Being so minded, I have tried hard to record arguments showing why cigarette smoking is bad for youths. But, although I believe my position to be the correct one, I have frankly to admit that my search for evidence has been difficult.

In seeking concrete information that would enable me clearly and forcefully to make my point, I read in vain the works of supposed authorities. Honestly I sought for enlightening facts, but found only platitudes—vol-

umes of platitudes. It is the iteration and reiteration of extravagant and unsubstantiated statements that is the weakness—and not, as they seem to suppose, the strength—of the superficial anti-cigarette crusaders.

First of all, I, of course, encountered the stereotyped statement of the school physiology to the effect that smoking stunts growth, and this I immediately found questioned by many of the best physicians. Then I thought that I surely had found something that would throw light on the subject when, after much trouble, I located a little book entitled *Why Boys Should Not Smoke*, by Thomas Cartwright, B. A., B. Sc. (London), with a commendatory letter by Major General Baden-Powell; but here was only another disappointment.

The book proved to be another volume of platitudinous and very extravagant statements, evidently designed to scare boys away from smoking, rather than to give them any definite, well founded reasons why they should not smoke, and thus make the book live up to the promise of its title. Yet the preface in this work states that it was designed as a supplementary reader in all schools! Because the book is typical of many I shall quote a few paragraphs:

Look at the sallow face and the lean and stunted figure of the young man, who when a boy, was a cigarette smoker. He is like a broken down old man. If he looks down from a height he becomes dizzy. And how stooped and lazy he is. He seems a regular loafer. The least thing makes his limbs tremble and

his heart beat. Such is the evil work of the cigarette upon the tender frame of growing lads.

Yes, boys, I repeat it, the deadly cigarette is your worst enemy, and the worst enemy of the country; and you who smoke it will help this enemy to ruin the British Empire by making its future men pigmy dwarfs with little bodily strength and even less strength of mind.

The author then tells how in one hundred years the average height of a Briton has fallen from five feet ten inches ("i. e. nearly six feet") to five feet five inches, and continues:

That is what the cigarette, smoked by foolish boys has done, and is doing for our race. I say this because a century ago the boy smoker was unknown, and because doctors agree that one of the chief reasons, if not *the* chief reason of this falling off in strength, is the deadly cigarette in the mouths of foolish lads.

If you really wish to grow up strong and hardy you must shun tobacco as you would shun the plague; for it will make you thin, stunted, pale, cross, lazy and dull. If you smoke you cannot grow.

Now, although I commend the cause that Dr. Cartwright espouses, I must submit that such statements are hardly the kind of "arguments" that can make a book live up to the title *Why Boys Should Not Smoke*. The soldiers who first took up arms for the British Empire in the latest war are reported to be, almost to a man, over five feet ten inches in height, and one of the surprising revelations of the war is that, almost to a man, they are, and have been from boyhood or early manhood, habitual cigarette smokers.

*Stature of
Soldiers
Belies
Statements*

The same awkward contradiction of facts is found in the true state of the German army as opposed to what good Dr. Cartwright says about Teutonic manhood. "In Germany," he declares, "it used to be said that one half of their young fellows who died before arriving at manhood were killed either wholly or in part by smoking."

It would seem, as a matter of fact, that these young men were killed only "in part," for the flower of robust German manhood has been doing some terrific fighting for the Fatherland and reports from the battle-front show that the cigarette, or some form of smoking, is considered as necessary to their physical welfare and bravery as is food itself.

But the subject of the cigarette in warfare is treated in another chapter. What I have here to note is that such statements as those made by Dr. Cartwright fail as arguments when it is known that in the class he condemns are not only the soldiers of England, but also many of her prominent statesmen, businessmen and scholars.

If Dr. Cartwright is correct, then these eminent figures are among those "sallow faced, lean, stunted" men; they are of the type that, according to this author, "has no pluck"; they are the kind of man who, again according to him, is so weak that "the least thing makes his limbs tremble and his heart beat"; they are all this because they have smoked cigarettes in their young days—and still smoke them. England is notoriously a cigarette-smoking country, and one that discrim-

inates as to quality, for the American tobacco cigarette, which is known there as "Virginia," is the prevailing smoke.

I say that I sought earnestly for convincing facts in this book with the promising title. When it failed me in one chapter I continued to hope for the next, and I was quite positive that I should discover what I sought when I came to the sections devoted to physiology. There, too, however, I was doomed to disappointment. Instead of reliable scientific statements, I found only such absurdities as these:

Action of Tobacco: If you count the beats of the pulse which, of course, depend upon the beats of the heart, you will find that there are 74 beats a minute. Tobacco injures the heart by making it beat much faster than this, nearly as much as 112 beats a minute. Thus the heart is greatly over-worked and is likely to become diseased, as is very often the case. After a time this great strain brings about a reaction, and the over-worked heart beats slowly and feebly, and sometimes stops altogether.

Test this author for yourself by comparing what he says about "poison" in tobacco with what, as we have seen in the earlier chapters of this book, science has demonstrated as the facts. Says Dr. Cartwright:

An oily substance with a long name that I will not trouble you with, and which is so very poisonous that a drop placed upon the tongue of a snake kills it at once. Yet there are no less than sixteen drops of this poison in an ounce of tobacco.

Now, everybody knows that tobacco is one of the few products of nature almost every-

where used among mankind, one of the products the consumption of which keeps pace with growing civilization. It is being consumed in ever increasing quantities amounting to hundreds of millions of pounds a year. If these remarks about its effects on the human body are correct, is it not a miracle that the human race—to say nothing about advancing in physical strength, in mentality and morality—has at all survived?

We have already had—and shall probably have again—frequent occasion to call attention to and confute such snap judgments and unfounded declarations as those of Dr. Cartwright; but, there comes to mind at this point one particularly glaring instance of false deduction that may well be placed beside those of the author of *Why Boys Should Not Smoke*.

This instance is to be found in the report of an experiment made by Dr. David Paulson, later President of the Anti-Cigarette League of America, while he was a student at the Bellevue Hospital Medical School. It is a report which has stood for a long time as a sort of standard among the enemies of the cigarette. Dr. Paulson tells how he soaked tobacco in water and injected a hypodermic syringe of the tobacco juice under the cat's skin. He describes the suffering of the poor cat, and its death, in less than twenty minutes, from violent convulsions.

Aside from the cruelties that they perform, such experimenters are simply patently un-

scientific. They are not dishonest; they really do not realize the difference between injecting nicotine into the blood of snakes, cats, frogs and other beings of a lower order, and the action of tobacco as used by normal human beings, whose systems are very soon made immune to the small amount of nicotine that is present in smoking tobacco, and that is especially minute in the case of cigarettes.

As the matter is expressed by one prominent physician of Johns Hopkins University, a man who has given a great deal of time to the study of tobacco effects: "To make their experiments logical the anti-tobacco pseudo-scientists should choose as their victims animals that have been immunized. If they ever do so, it is quite certain that they will find that nicotine, in small doses, has practically no effect whatever."

From the experiment of Dr. Paulson, and other similar ones, it will be seen that we have in this country critics of the cigarette who are quite as intemperate and platitudinous in their statements as is Dr. Cartwright. Another instance is, however, worth citing here and now. It is to be found in a little booklet published by a well-known American automobile manufacturer and gratuitously distributed broadcast. Therein Mr. Hudson Maxim, inventor of many things, including smokeless powder, has remarked:

The wreath of cigarette smoke which curls about the head of the growing lad holds his brain in an iron grip which prevents it from growing and his mind

from developing just as surely as the iron shoe does the foot of the Chinese girl. * * *

If all boys could be made to know that with every breath of cigarette smoke they inhale imbecility and exhale manhood; that they are tapping their arteries as surely and letting their life's blood out as truly as though their veins and arteries were severed, and that the cigarette is a maker of invalids, criminals and fools—not men—it ought to deter them some. The yellow finger stain is an emblem of deeper degradation and enslavement than the ball and chain.

Those utterances are under the department heading "Some Scientific Facts." One wonders why! They are simply resounding statements with no semblance of proof behind them.

My search for authoritative opinions, based on sound reasons, as to why the use of tobacco should be postponed until maturity is reached, was not, however, without some more or less satisfactory results. I did find that, luckily, there are investigators much more scientific, and therefore much more temperate, than Dr. Cartwright, Dr. Paulson and Mr. Maxim.

This better class of investigator throws some real light on the subject. There is, for instance, Professor Alfred A. Woodhull, of Princeton University, who in an article in *American Health*, says:

Example commonly leads to the first use of tobacco, and example is very strong with youth, especially youth without, or defiant of judicious control. Primarily, tobacco is physiologically offensive: but toleration, a peculiarity of the nervous system, is estab-

lished sooner or later. Following toleration its use gives satisfaction to nearly all, and this in most cases increases to desire and, in succession, to a demand which with many becomes a positive craving, insistent upon gratification. In the young the nervous balance is more easily disturbed and the consequences of such disturbance are more conspicuous than with the mature.

An exceedingly rational view is given by J. H. Tilden, M. D., of Denver, whose writings bring the responsibility for the cigarette boy forcefully to the door of the parents, where, of course, in most cases it quite rightly belongs. He says:

Just how much harm is being done to the human race by cigarette smoking is hard to say, but the cigarette is not altogether to blame. Show me a child that has been raised normally—fed properly, kept away from coffee, tea, chocolate, cocoa, and given no meat until five or six years of age, and then very little; fed good wholesome food; that has slept in a well-aired bedroom; that has been taught to obey, to have some self-discipline, to know domestic authority—and I will show you a child that will not take to cigarettes or to any other form of tobacco.

The tobacco habit is one of the legitimate cravings of a degenerated hunger—it is the normal demand made by a diseased nervous system. This is so true that it ought to be common knowledge. The cigarette *per se* is not harmful, for a normal child would not put it in his mouth, and, if it did, it would throw it out very quickly. Mothers and fathers and society generally need to know the importance of having children reared right as regards food and all environments, and then we will not need prohibition to protect us from alcoholics, tobacco and the slum life.

Dr. Tilden also points out that the problem of the boy and the cigarette may be approached from either of two directions—demand or supply. He maintains that it is a good thing to prevent the demand in juveniles, and that a cigarette would have no attraction for a boy, be no temptation to him, if he had always been properly fed and well trained.

Furthermore, he states a truth that should be an incentive to all boys who are sensible enough to realize that it is wise to wait patiently until the proper time for the best things in life. This statement is that “the best satisfied smokers are those who began after maturity.”

There is, however, another phase of this matter. I mean the economic phase, and in it

***One Good
Reason Why
Boys Should
Not Smoke***

I find one very good reason why youths should not smoke cigarettes. It is, moreover, a reason that is far more easily proved than any based on physiology or morality. Here it is: So deep-seated has become the prejudice against the cigarette-smoking boy that a large number of business men either do not employ or else openly discriminate against boys who smoke.

While this prejudice is by no means general, it has become apparent in many places, especially where crusades against juvenile smoking have been conducted. Why should any boy, whose enjoyment of smoking will become keener if he awaits maturity, jeopard-

dize employment or promotion because of a desire to smoke?

Nor is it on the economic side alone that we find our most legitimate arguments against the use of tobacco by the youth. Even the best friend of the cigarette will admit that there is a moral phase to the question, although he will be equally honest in pointing out that this phase is by no means as serious as the unknowing critics would lead us to believe.

If our social system were similar to that in Latin-American countries, or in some advanced European countries, where cigarette smoking is taken as a matter of course by both men and women, we should have no juvenile cigarette problem; but here in the United States the youth is more than likely to smoke surreptitiously. More often than not he does his smoking away from home and keeps from his parents the fact that he is smoking. This is deception, and deception weakens character.

Such a statement nobody will deny. Nevertheless, the worst that can, in this phase of the matter, be said against the cigarette is that it is *one* of the things about which a boy may lie to his parents. It is only a single example of a good many things about which he is prone to practise deception. There are many phases of American life that lead to deception by the young. To say, therefore, that the cigarette in itself makes a good boy bad is as absurd as it would be to say that it makes a bad boy good.

Since deception is one of the tendencies sure to be found in boys already inherently bad, it follows that such boys are not infrequently smokers. Because of their inherent badness—and obviously not because of the smoking—they are likely to fall into the hands of the law. Thereupon the opponents of tobacco issue grotesque statements concerning the number of cigarette smokers among youthful offenders and ask us to believe that there is a direct relation between the cigarette and delinquency, or incorrigibility.

***Mistake to
Link Crime
with the
Cigarette***

This is all very well, but the fact is that the high percentage of cigarette smokers among juvenile offenders, as *reported*, is strikingly at variance with the percentage as found—by the men that have the best opportunities to study them—among the street children from whose ranks such offenders are recruited.

For an example of the discrepancy here evident, we need go no further than to Judge Benjamin Lindsay on the one hand, and to the principal of a New York East Side public school on the other. Judge Lindsay, as head of the Denver Juvenile Court, has performed a wonderful social service, but he is an enemy of the cigarette. The school principal is not on record as for or against the cigarette, but has under his care children of that class which produces the vast majority of incorrigibles and youthful gangsters. In the automobile

manufacturer's booklet already referred to we find Judge Lindsay declaring:

One of the very worst habits of boyhood is the cigarette habit. This has long been recognized by all the judges of the courts who deal with young criminals, and especially by judges of police courts, before whom pass thousands of men every year who are addicted to intemperate habits * * * One bad habit led to another * * * The cigarette habit not only had a grip upon them in boyhood, but it invited all the other demons of habit to come in and add to the degradation that the cigarette began.

On the other hand, our East Side school principal as decided'y remarks that the percentage of cigarette smokers among the East Side boys is very small; that among those with whom he comes into contact it is, according to his observation, less, indeed, than one per cent. He says that there are so few cases of cigarette smoking in his school that the cigarette never has been a problem there. Yet it is on such children as he has charge of that the juvenile courts most heavily draw.

When two such authorities so pointedly disagree, who is to decide? Nobody doubts Judge Lindsay's word, but then nobody will doubt the word of the East Side school principal. There is only one way in which to determine the matter. That is to remember that the crusader is so mentally constituted that he always finds what he is looking for and then to remember that Judge Lindsay is a crusader, whereas the school principal is without prejudice. There is probably a great deal less cigarette smoking among young boys of any sort than is generally supposed.

In any event, Judge Lindsay has more than this one opponent. The preponderance of opinion by judges and social workers is contrary to the Denver reformer, there being no proof and no general belief that the cigarette is ever the direct cause of crime.

Thus, to quote but a few, Justice Franklin C. Hoyt, one of the Justices of the Court of Special Sessions who preside over the Children's Court in New York, gives us a rational and temperate view. In a recent interview he said: "While I consider it wholly bad for growing boys to smoke cigarettes, I do not think that cigarette smoking itself directly leads boys to crime. It is an incident and indication of their evil environment."

B. J. Fagan, a probation officer attached to the Children's Court, has given this opinion: "Cigarette smoking among young boys has been a contributing cause in truancy, but I have never found any case where cigarette smoking has led directly to crime among boys."

And, in an article in the *Indiana Medical Journal*, Dr. William B. Fletcher wrote:

I have sometimes asked myself if we of the medical profession are not largely responsible for the widespread prejudice against the cigarette. It is so much easier to agree with the grief-stricken mother in assigning the cause of the loved one's downfall to the innocent habit of cigarette smoking, than to state to her frankly the real cause which examination has revealed, or which has been imparted under the seal of professional confidence.*

**Indiana Medical Journal*, Vol. XXIV.

Katherine B. Davis, New York Commissioner of Correction, who has had many years of experience in reform work, recently declared that "it is more important that boys should not lie than that they should not smoke."

Burdette G. Lewis, Deputy Commissioner of Correction in New York, has throughout practically all of his mature life been devoting his time to the study and relief of the fallen and the unfortunate of various ages and social levels; yet, in an interview on the cigarette-smoking boy, it was Commissioner Lewis who gave the following extremely rational and illuminating estimate of this disputed phenomenon.

I have not found anybody who actually can show that cigarette smoking by boys has led to crime, but I have been informed by competent medical authority that excessive cigarette smoking tends to undermine the health of growing boys.

The smoking of cigarettes among boys, and the use by them of tobacco in general is one of those tendencies which, taken together with many other things, leads to their physical deterioration. On the other hand, I would rather teach the boy not to lie and steal than to try to induce him not to smoke cigarettes, because I think the latter is a minor evil.

I think that the average boy in a reformatory might be allowed to smoke for several years without seriously interfering with more important reformatory work. After our reformatories are put into a position to teach boys not to lie and steal, and not to defile their own bodies, then is the time to consider the alleged evil effects of cigarette smoking.

This is the view of a man that ought to understand the subject in hand if anybody can understand it, and behind him he has not only the body of authority to which we have already referred, but a still more expert body—our prison officials, the heads of our juvenile reformatories and the teachers in those institutions. Among them the consensus of opinion is that crime and incorrigibility are never traceable to the cigarette, but that the seat of the trouble lies much deeper. The smoking of cigarettes is at most only incidental.

To poverty, bad environment, bodily abuse, lack of home discipline, malnutrition, and a legion of similar evils can be definitely traced, as every sociologist knows, the stream of crime that empties at last into our juvenile courts.

I hope that I have in no wise conveyed the impression of attempting to defend the smoking of cigarettes—or of anything else—by youths. I do not. My object here has been simply to offset the irrational and intemperate statements of zealots with rational views of persons qualified to speak with authority.

What those persons have said—and not what the zealots have tried to say—confirms me in the opinion with the expression of which I began this chapter. I believe that tobacco should not be used before maturity has been attained.

But the best of all arguments against the smoking of cigarettes by minors seems finally to me to be the fact that such smoking is un-

lawful in most states in the Union. For my part I wish it were unlawful in every state.

This legal side of the question I consider in a later chapter. Here and now I maintain that, in the interest of good citizenship, we should see to it that the children of our country are made to respect the law.

CHAPTER XVI

SMOKING AND EFFICIENCY

Stock Statements of the Physiologies Are Mere Generalities

—Noted Athletes Cigarette Smokers—At Odds in Baseball Circles—More Smokers Than Non-Smokers

Win Contests—The Cigarette and Mental

Efficiency—Men of Master Minds

Users of Tobacco.

WE HAVE now seen what a help smoking, cigarette or other, is to the ordinary man seeking comfort and solace in the regular affairs of his life. We have seen what a help it is to that man in critical moments, and we have seen how tobacco is recognized by governments as soothing to the fighting soldier and how, by restoring him to a normal state, it nerves him in the hour of battle and strengthens him in the face of death.

It remains now to show that what smoking does for the persons just mentioned it has done and is doing for men of master minds in every department of life and has done and is doing not only for the master minds which must be kept at the top notch of efficiency, but also for the men of master body for whom success depends upon the steadiness and readiness of their nervous system, the hardness and resilience of their muscles and the perfection of their general health.

Than the athlete's there is no line of human endeavor which calls for steadier nerves and a clearer brain. There is no line of effort that

calls for higher general efficiency, that requires, in fact, more perfect operation of both body and mind than his. Hence, in athletics, smoking, and especially cigarette smoking—for that is the form of tobacco that most athletes use—should receive its severest ordeal.

Upon summarizing the information derived from well-known athletes and from scientific investigators, there can be made the general broad statement that for every one declaration that smoking is bad for athletes, several statements may be cited to show that the use of cigarettes, or tobacco in other forms, does no harm whatever.

This state of affairs throws an illuminating glare on the carelessness of fact indulged in by the anti-cigarette crusaders. Of all the arguments brought forward by the antagonists of tobacco, there is none that has become such a commonplace as that no athlete would think of using the weed, above all in cigarette form, while in training or at the time of contests. Every schoolboy has heard the argument a hundred times.

As I have brought out in another chapter, it is certainly wisest that children of growing years should not smoke cigarettes or anything else, and to prevent their doing so any fair argument should be put up to them. But the argument should not be of a sort that a boy with his own eyes sees defeated, as he often does, in the case of the athlete and the cigarette, when he admiringly watches trained athletes at their work.

In the search for authentic data on this phase of the subject of cigarettes, it was natural first to consult the works of physiologists. They disagree. I shall quote first from Dr. W. S. Hall, Professor of Physiology in the Medical School of Northwestern University. Dr. Hall is the author of a text-book on that branch of science for medical students and physicians. I select the following passage because it bears on what I have just been writing, and is typical of most such text-book statements, which are often mere generalities. In a pamphlet on medical views on the subject of tobacco, Dr. Hall says:

Stock Statement of the Physiologies "Every schoolboy knows that when athletes are training for a contest they are obliged to abstain absolutely from all forms of tobacco. Is this done on theoretical or moral grounds? Not at all. It is done because experience of many decades demonstrates that when men use tobacco they cannot do as well as they can when free from its effects. Under the influence of tobacco the young man is less alert, less steady, and has less endurance."

This sounds sweeping; but when we come to analyze what Dr. Hall has said, we find that it is only another general statement of the sort that has been in text-books for generations—that it is without any proof, that it offers no evidence of investigation.

On the other hand, in seeking data first-hand from noted athletes, the investigations for the purposes of this book brought forth abundant contradictions to such general

statements. Ray Ewry, one of America's famous athletes, who for years has held various jumping championships, was among those interviewed. In substance he said:

"I have been smoking cigarettes for twenty years and have always smoked while in training. The habit has never grown on me, and my average is from twelve to fifteen cigarettes a day. There is no form of athletic contest that demands more perfect condition, especially peace of mind, confidence and forgetfulness of all physical limitations than does the standing jump. This is readily understood when it is considered that it is the only athletic contest which depends entirely on the initial effort. There is no chance to recover any primary loss, for there is no secondary effort of opportunity to make up through extra exertion as is the case in more prolonged contests.

*Noted
Athletes
Cigarette
Smokers*

"When in a contest I must feel so perfectly well that I am conscious of no disturbing element. The tiniest pebble in my shoe, a bad taste in my mouth, anything that in any way takes my attention works against success."

There is no theorizing about that. It comes from a man who has proved what he says by the most practical of tests, and it is a direct and wholly convincing answer to Dr. Hall's assertion that "when athletes are in training for a contest they are obliged to abstain absolutely from all forms of tobacco."

And this jumping champion is a man who, in his successful business life, requires the

steadiest of nerves in his day's work. He is a mechanical engineer in the Engineering Department of the Board of Water Supply of the City of New York. Yet neither in his training for contests nor in his work does he feel called upon to forego his consistent enjoyment of cigarettes. You may say that this is a rare, isolated case; but it is not. I have similar information concerning a large number of the most noted athletes in America.

Against such testimony, now that we are upon this phase of the matter, it is possible to quote—and I want to be frank and do so—a statement by **At Odds in Baseball Circles** Connie Mack, leader of that famous baseball team, the Philadelphia Athletics. Some time since, in writing for the *Scientific Temperance Journal*, he said, among other things: "No boy or man can expect to succeed in this world to a high position and continue the use of cigarettes."

Yet here again all that we have is the sweeping statement with no proof to back it. Indeed, Mr. Mack's position is peculiarly unfortunate, since at least eight of the players whom he chose and upon whom he depended for the wonderful success of his team in 1914 did what many other celebrated ballplayers have done—they publicly indorsed a popular brand of cigarettes.

Fortunately for our present purposes, there has been a tendency in recent years for scientists—stimulated, perhaps, by the remarkable growth of cigarette smoking with

certainly no falling off in the general efficiency of the nation—to investigate this subject from a practical standpoint. Let us glance at the results of their investigations.

Among the most significant studies is that by E. L. Clarke, published in the *Clark College Record* for July, 1909. Mr. Clarke made a painstaking record of 201 students and found that 46.3 per cent. of them smoked. He records that *the smokers exceeded the non-smokers a little in strength and in lung-capacity, and that 26 per cent. of the smokers won athletic contests against 16 per cent. of the non-smokers.* *More Smokers Than Non-Smokers Win Contests* Professor Clarke thus sums up the results of his inquiry:

1. As a rule the non-smoker is mentally superior to both the occasional and the habitual smoker.

2. As a rule the non-smoker is equal, and probably slightly superior, physically, to all members of the smoking classes except the athletes. It may well be queried as to whether the smoking athlete does not make his gain at too high a mental cost to make it pay. No one would contend for a moment that smoking is the sole cause of these differences. There are numerous other factors that are inseparably linked with it.

What is true of American athletes appears, as one would of course expect, to be true of athletes the world over. For instance, let us consider England. In an article on "Tobacco Smoking" published in the *St. Bartholomew Hospital Journal* an associate of Sir Lauder

Brunton says, as to the effect of tobacco smoking on students:

I must admit that I began to feel some doubt about the baneful action of tobacco when I met a few runners, undeniably in the first flight, who continued smoking right up to the very hour of their contest. This doubt has been strengthened by a contemplation of the comparative laxness outside university circles, where one may see athletes, whose excellence is unquestionable, regular smokers, and, in some cases, really big smokers . . . I cannot trace the slightest influence of tobacco on physical efficiency.

Smoking is notoriously common among golfers. I know many and among them the most expert smoke cigarettes. Harold Hilton, English Amateur Champion, is a devotee of the cigarette. I could mention scores of others. In discussing this subject of athletics and smoking, one of the most noted all-round athletes in the world, a man who has made world records in broad and high jumps and in running races for various distances, said that, although he had smoked cigarettes from boyhood, he eliminated them from his diet while in active training. That is a rule of a majority of cigarette-smoking athletes; but they also, while in training for contests, eliminate from their diet many kinds of wholesome food, as well.

Why is this done? The answer is simple and in no wise militates against the cigarette. The rigorous discipline that men are subjected to by trainers makes for an abnormal mode of living calling for abstinence from

many foods and also from practices that are considered perfectly healthful for people engaged in normal occupations, and for the athletes themselves when they are not in training.

Tea and coffee usually are forbidden, but that does not make them generally condemned. Very often milk is forbidden, yet no one would say therefore that milk is bad for all men at all times.

Usually meats of all kinds are put under the trainer's ban, yet even the most radical vegetarians have not seized upon this as a clinching argument for general condemnation of flesh as a diet.

No more does this forced abstinence from cigarettes prove that they are detrimental to the athletes, or to anyone else, under the conditions of normal life.

The list of noted athletes who smoke cigarettes, and who did smoke them while they kept on winning hard-fought contests, might be made a long one. It would seem that condemnation of the cigarette because it frequently is barred in training quarters is, to say the least, not well founded.

Again and again we hear the statement that smoking decreases mental efficiency. Does it? There is abundant evidence that it does not. The evidence of eminent medical authorities and the evidence of an imposing array of geniuses in almost every profession and every branch of high arts—men who lead all others in the bril-

*The
Cigarette
and Mental
Efficiency*

liance of their minds and in the things they have done and are doing for the advancement of the knowledge and the general welfare of mankind. On this point, in an article in the *Technical World Magazine* on "The Truth About Tobacco," F. C. Walsh, M. D., writes:

There is a psychological basis in stating that anything pleasurable stimulates the imagination and is conducive to reverie. Now, much of original scientific research, and nearly all inventions, are based upon scientific use of the imagination. Much of the work of the poets and novelists is likewise due to reverie. A great financier or railway president may also plan a coup while physically relaxed but mentally stimulated in a pleasurable way by the taste or odor of a good cigar.

All creative work of a purely mental nature, which is at the same time largely dependent on a quick and lively imagination, may be said to be assisted by tobacco, but for brief periods only. To those, then, who live or take their recreation through the imagination, tobacco is both a pleasure and a spur to efficiency.

Plenty of other expert opinions could be produced to this effect. Among them is that of no less a savant than Dr. Norman Kerr, F. L. S., of London, whose works place him at the head of authorities among English-speaking people in matters concerning the effects of stimulants and narcotics upon the human system. Says Dr. Kerr:

With persons of a certain temperament the use of tobacco produces concentration of thought, mental satisfaction, protection against infection, and domestic happiness. There are persons so constituted that the intellectual powers require to be aroused and

concentrated before any definite intellectual effort can be even entered upon. To such persons tobacco smoking has proved invaluable, the advantages far out-weighting the disadvantages. No other substance, narcotic and anaesthetic, is yet known which would serve this purpose and do so little damage.

Were tobacco not known, the idiosyncrasies of such individuals would interfere with the achievement and excellence of their work.

For just one moment consider the matter not solely in the light of ordinary common sense. It stands to reason that a plant which could fasten upon mankind throughout the civilized world, in the short space of four centuries, a habit which during all that time has grown and is growing faster than the increase of population—a plant that has become known and has been cultivated in every portion of the planet—must meet an essential want of the human body and mind. Such is tobacco, and its use—even its efficacy, we believe—has grown enormously since the introduction of the cigarette, the mildest form in which it can be employed.

Of all the commodities on earth, tobacco is the only one common to the consumption of every race and every social condition. As a comfort to the lowly and as a luxury to the rich, it unites all men in a common pleasure. And more and more as the years roll on men are turning from the pipe and cigar to the milder cigarette.

There is no doubt that now the cigarette is the favorite form of smoking by physicians themselves throughout the United States, as

it long has been among all the professional men of Europe. Among its devotees here and abroad are a great many clergymen and thousands of lawyers, bankers, statesmen, writers and college professors.

As a matter of fact, the still frequently advanced "argument" that men of master minds are not addicted to the use of tobacco is an argument merely of meaningless words, for to record the names of famous men in the ranks of smokers would be like publishing a "Who's Who" of the world's greatest intellects. Of course it might be said that these men ate and drank in common a good many things that may or may not have benefited them, and there would be no point in developing this theme if it were not for the fact that there is abundant evidence that smoking never did them any harm. Such evidence there is, however, in plenty.

We have it from their physicians and also from these famous personages themselves, that they have found in tobacco, in common with the mass of mankind, not alone the one negative virtue of no ill-effects, but the three positive virtues of comfort, solace and inspiration.

Charles Lamb, the "gentle Elia," was an immoderate smoker and wrote: "For thy sake, Tobacco, I would do anything but die." Robert Louis Stevenson alternated between cigarettes and cigars, sometimes smoking as many as twenty of the latter in one day and

at other times as many as eighty of the former.

Nearly all Continental authors, including George Sand (Madame Dudevant) have always been excessive smokers, and the list of famous writers in our own language who were smokers, or of our living writers who are smokers, would, indeed, practically exhaust a history of our literature. To mention but a few names at random, there are Milton, Gibbon, Dickens, Thackeray, Carlyle, Tennyson, Mark Twain, Byron, Addison, Scott, Emerson, Izaak Walton, Thomas Moore, Bulwer-Lytton, Thomas Bailey Aldrich, Oliver Wendell Holmes, H. G. Wells, John Galsworthy, Stephen Crane and Rudyard Kipling. There are scarcely any living writers of note in America who do not smoke. I know personally a large number, and a great majority of them smoke cigarettes and prefer this form of smoking.

A list almost as imposing could be made of ecclesiastics and clergymen who have been regular smokers, but a truly militant example will be found in the case of Rev. Charles Spurgeon, the great evangelist. He was a smoker, and so was that other noted evangelist felicitously named Pentecost. The latter, at a service at which the former was present, said that, as a matter of self-denial, he was giving up tobacco. Mr. Spurgeon arose and remarked:

"Notwithstanding what Brother Pentecost has said, I intend to smoke a good cigar to the glory of God before I go to bed tonight. If anybody can show me in the Bible the com-

mand 'Thou shalt not smoke' I am ready to keep it—but I have not found it yet."

Long and brilliant, likewise, is the list of eminent scientists that were in their day, or are now, smokers. The great Huxley, who regretted that he did not learn of the solace of tobacco until some years after reaching manhood, said in his later years: "For my own part, I consider that tobacco, in moderation, is a sweetener and equalizer of the temper."

Sir Isaac Newton was an inveterate smoker, and, says F. W. Fairholt: "As if to show the fallacy of many objections to tobacco, one being that it injures the teeth, though he lived to a good old age he lost but one tooth."

Among inventive geniuses there is scarcely an exception. Dr. Charles P. Steinmetz, the wizard of the General Electric Company, is an almost constant smoker. Thomas A. Edison, opposed to cigarettes, prefers to find his solace in chewing tobacco; but Guglielmo Marconi, inventor of the wireless telegraph, which well ranks as a modern world-wonder, is a devotee of the cigarette.

Many noted jurists whom I have met are cigarette smokers. One whom I have in mind is Justice Bartow S. Weeks, of the New York Supreme Court, whom I was tempted to mention earlier in this chapter when writing about athletes who smoke cigarettes. Justice Weeks is almost as well known for his interest in athletics as he is for his legal wisdom. He was an athlete of great ability in his younger days, has been President of the famous New York Athletic Club and of the Amateur



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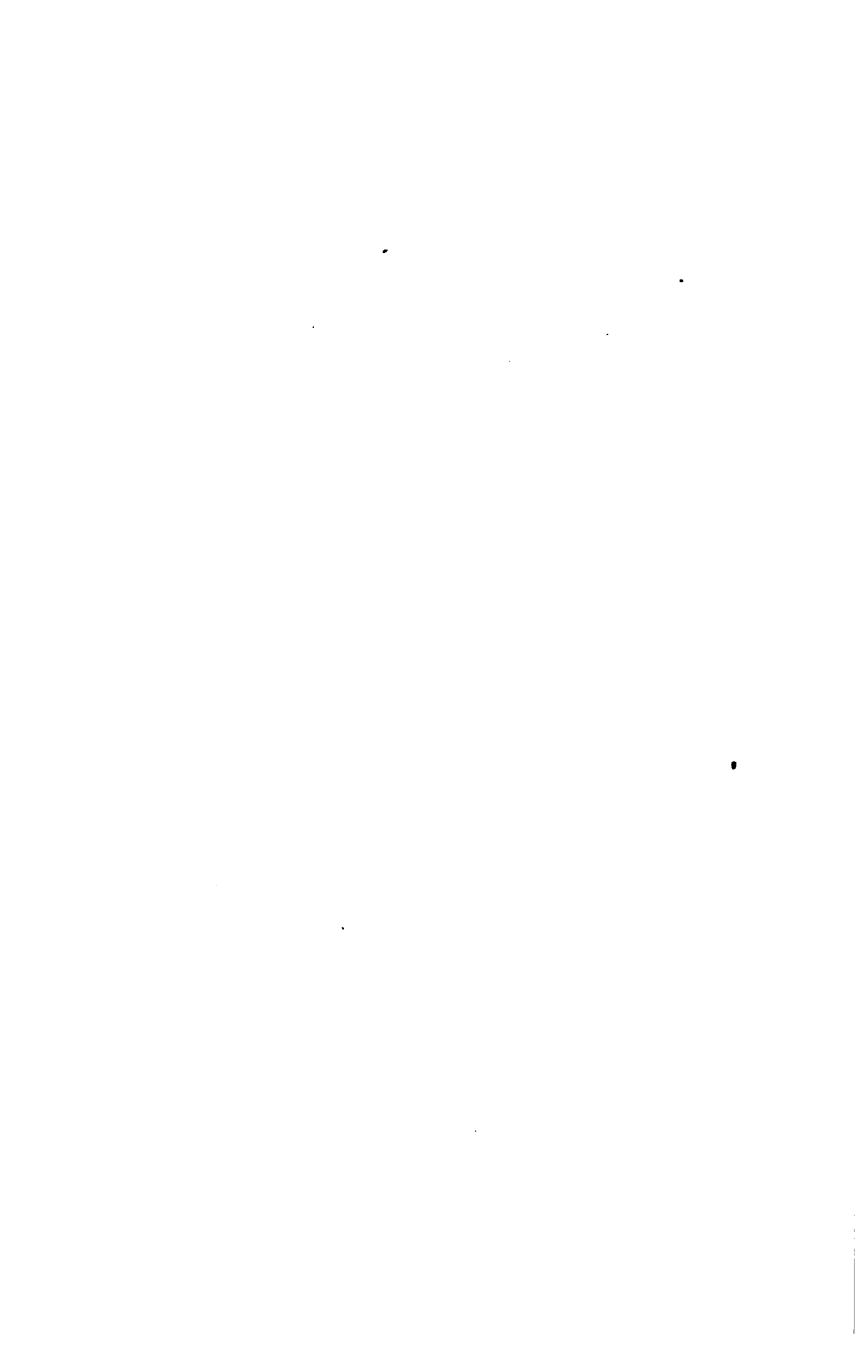
Photo. from Paul Thompson, N. Y.



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RULERS WHO ENJOY THEIR CIGARETTES

At the top are shown the Czar of Russia and the German Kaiser before they went to war, mutually enjoying cigarettes when starting on a hunting expedition, and the Kaiser on horseback in war regalia with his inevitable cigarette. At the bottom, left, the King of Spain is lighting his cigarette while Spanish peasants endeavor to start his stalled automobile. At the right is King Albert of Belgium.



Athletic Union, and is at present the Chairman of its Legal Committee as well as Secretary of the American Olympic Committee, and yet he is a cigarette smoker.

We have already seen how Major General George W. Goethals, to whom the nation is largely indebted for the Panama Canal, saw to it that cigarettes were supplied to the men under him in that work, because he considered them essential to their comfort and best working ability. General Goethals is himself an inveterate smoker of cigarettes and has been for years, but he is also one of the world's greatest engineers and a powerful executive. There is certainly no better answer than this to the question of the relation of cigarettes to efficiency, both physical and mental.

Nearly all of our Presidents, from Washington, who was one of the leading tobacco planters and exporters of his time, down to the present, have been users of tobacco in one form or another; and practically all of the rulers of other countries for the past two centuries were, or are, smokers. That is a general statement of the kind which I have purposely avoided in this book, because general statements prove nothing; but in this case it is used because it would be tiring to the reader if I were to be specific and attempt a catalogue of names.

In the same vein I may safely say that most of the world's great generals and military geniuses from Oliver Cromwell's time have

*Gen. Goethals
An Inveterate
Smoker of
Cigarettes*

been smokers. No reader of the chapter on "The Cigarette in War" will be surprised at the above statement, nor wonder at the fact that the leaders of the armies of all of the nations now at war in Europe are smokers of cigarettes—Kaiser Wilhelm and the Crown Prince of Germany, and the Kaiser's staff almost to a man; King Albert of Belgium and his staff; Czar Nicholas of Russia and his staff; King George of England and Sir John French, the British Commander-in-Chief, and General Joffre, of the French army.

It is well, however, to return to science by way of concluding this chapter. On this subject of smoking and efficiency the *New York Medical Journal* recently published an editorial that said:

Smokers of pipes and cigars, to say nothing of chewers, are unable to appreciate the delicacy and fine flavor of a cigarette for the same reason that a man who dines habitually on steak drowned in Worcestershire sauce, is unable to savor the triumphs of the French chef with his ethereal and artistically combined relishes.

The cigarette is not for boys, but for grown men of good taste. It occupies with regard to other forms of tobacco the same relation that a fine old claret or burgundy does to the heavy and noxious product of the still.

Prohibitionists confound all the latter under the generic term of "rum"; they are consistent when compared with smokers of the heavy Havana tobacco, who fall in with its manufacturers in attacks upon the comparatively light and harmless Turkish and Virginia products. Men are well within their rights in forbidding cigarette smoking and other pleasures and distractions to their employees; it is

another matter when they seize upon a nation wide opportunity to compound with vices they've a mind to, by damning one they're not inclined to, especially when the latter affords needed solace and recreation to millions perfectly capable of judging what is and what is not good for them.

In Europe, where a good deal of logical thinking still prevails, there is probably not one smoker of distinction in any walk of life who does not include the cigarette in his nicotian armamentarium.*

With such opinions from such sources, and with such examples from life to confute the enemies of the cigarette it seems to me that their case is badly shattered.

**New York Medical Journal*. Issue of July 25, 1914.

CHAPTER XVII

CIGARETTE LEGISLATION

**Opinion of a Cigarette Manufacturer—Question of Age Limit
—States Changing "Anti" to Minor Laws—The
Power of Popular Prejudice.**

WE HAVE now seen the cigarette in all the stages of its development. We have studied its growth to popularity both at home and abroad; we have watched the wonderful increase of the cigarette industry, and we have examined the opinions for and against its alleged defects and its virtues. Surely we should at last be in a position to face the one remaining question that the subject presents to us, the question of legislation: *What is the duty of the State in regard to the cigarette?*

Before consulting the statute-books, the legislators that make them, or the judges that enforce their provisions, it occurred to me to secure, by way of beginning, a thoroughly prejudiced view. I thought it would be interesting to hear a cigarette manufacturer inveigh against any interference with his business by the State. I knew that I would not agree with him in such an invective, but I thought it a good plan to secure his thesis and then gather material for its refutation.

Consequently I interviewed one of the highest officials of what is doubtless the largest single corporation manufacturing cigarettes in the United States. I bluntly

asked him to state the attitude of his company toward anti-cigarette legislation. Imagine my surprise when he made this answer:

"No intelligent manufacturer objects to the enactment and enforcement of state laws prohibiting the sale of cigarettes to minors. We do not. In fact we heartily endorse and encourage such legislation.

"Naturally we object to sweeping prohibitive laws that deny grown men the right to smoke what they please. Such laws never are enforced and tend toward a disregard for all laws. A law passed without the force of general public opinion back of it, one that encroaches upon the thoroughly American principle of personal liberty, always is a dead letter—made only to be broken, and is therefore a corrupter of public morals. A few states have been wise enough to enact good laws prohibiting the sale of cigarettes to minors. They could be and are being enforced."

For the time I was dumfounded. Here was one of the heads of a vast cigarette manufacturing concern taking a sane, temperate and aloof view of a question that vitally affected his business. It was the view at which I, with nothing to gain or lose, had long ago privately arrived; it was the view that, I am convinced, must be held by any individual who is neither profiting by the cigarette industry nor taking part in one of the crusades against it.

The further I sought, however, the more I came to see that cigarette manufacturers as a class agree with that opinion which had at first surprised me. Perhaps this is because only men of a broad mind can successfully manage a great business.

I have studied the statutes of many states, dealing with cigarettes. In all of the laws prohibiting the sale of cigarettes to minors I have found much good and most of them are effective because their provisions can be enforced. In none of the out and out anti-cigarette laws have I found any good—they are ineffective because their provisions cannot be enforced. They are farces; they are “dead letter” laws, and the sooner we get over that kind of legislation in this country the better we will be.

Pennsylvania has a drastic minor cigarette law which has been in force since May, 1913. It has, therefore, had a fair trial. It has provisions that can be carried out and it is being enforced.

In that state few boys now attempt to defy the law, for they have learned, through bitter experience, that punishment swiftly follows its violation. The result is that the youth of that commonwealth have a higher respect for all laws than they would otherwise have. Certainly they have more respect for law than the youth of those states having anti-cigarette acts, who every day see these laws flagrantly violated.

Convincing indeed is the following letter

from the Associate Superintendent of the Pittsburgh Public Schools written January 8, 1915, to the editor of one of that city's leading newspapers:

In answer to your inquiry of recent date as to my opinion of the Pennsylvania law in relation to the sale of cigarettes, I have no hesitancy in stating that I believe the law is a most excellent one.

During the fifteen years in which I was Superintendent of the Public Schools of Pittsburgh, I became acquainted with the cigarette habit of school boys.

Since the passage of the Pennsylvania law, the improvement has been so marked that we seldom have any complaint of any kind any more.

You need have no hesitancy in recommending this law to any other states or to any people interested in the matter of cigarette legislation.

Yours very truly,

SAMUEL ANDREWS,
Associate Superintendent.

Here is another letter of similar import. It was written by the Secretary of the Board of Public Education of Pittsburgh, in January, 1915:

In reply to your inquiry regarding my opinion as to the effect of the present law controlling the sale of cigarettes in the state, permit me to say, since the law now in force prohibiting the sale of cigarettes to minors was passed we have had less trouble with the boys smoking cigarettes than at any other time during the last twenty years.

Very truly,

G. W. GERWIG, Secretary.

I have already firmly expressed my opinion that it is better that growing youths should not use tobacco, and I am sure that all fair-minded people will agree with me in this, just as they will agree that the growing child should abstain from other things which are harmless, or even beneficial, for the adult. The only question about the wording of the so-called minor cigarette laws concerns the age limit.

Many who give close attention to this subject believe that the legislation would be far more effective, and its purposes more equitably carried out, if, instead of applying to all minors, this limit were reduced to an age somewhat below twenty-one years. Indeed the tendency now is in favor of eighteen as the proper period at which to draw the line of limitation.

Every state in the country which has not got an anti-cigarette law has a minor law of some sort. The age limits range from fifteen to twenty-one years.

Let us now glance at some of the other states in which anti-cigarette legislation has been attempted. The states that have laws prohibiting the sale of cigarettes to anyone are: Arkansas, Iowa, Kansas, Nebraska, North Dakota and Tennessee. South Dakota had an anti-cigarette law that the Supreme Court declared unconstitutional excepting as it applied to minors. Washington, Indiana and Minnesota have

*Question
of the
Age
Limit*

*States
Changing
"Anti" to
Minor Laws*

repealed absolute prohibition laws and substituted laws prohibiting the sale of cigarettes to persons under age.

Wisconsin, after some experience of an habitually broken anti-cigarette statute, followed suit in 1915.

One of the dead-letter laws passed by the first legislature of Oklahoma after that quondam territory was admitted to statehood was an anti-cigarette act, which the latest legislature of that state has repealed, substituting a minor cigarette law with provisions that can be enforced. The State Superintendent of Education, Mr. R. H. Wilson, was one of the most active champions of the new act.

These facts show a strong tendency in a generally right direction. There never has been a time when cigarettes were not sold freely and openly in states that had, or have, anti-cigarette laws.

Very rapidly the total prohibition states are realizing that such statutes are bad public policy, that there is no necessity for legislation to "burn the house in order to roast the pig," and that it is better to replace demoralizing laws with reasonable laws that can be enforced.

Thus there is every evidence that anti-cigarette legislation, which a few years ago was rampant all over the country, is rapidly dying out. The latest notable attempt to revive it was made in the Georgia legislature, but it resulted in the killing of the measure unborn. It was this proposed measure which called

forth caustic editorial remarks from no less an authority than the *New York Medical Journal*, which publication often has expressed itself forcefully concerning restrictive cigarette legislation. Commenting on the threatened action of the Georgia legislature, it says:

It is simply an unwarranted infringement of personal rights and a curtailment of the degree of free agency to which every man is naturally entitled. It is the sort of law which, being essentially non-enforceable on the one hand and on the other creative of anger and a spirit of opposition, brings all law into hatred and contempt. It is, further, a stage in the progress of a movement which causes grave misgivings and fears among the judicious.

The law is unenforceable under present conditions because it cannot avail to prevent all who care enough from getting supplies of their favorite form of smoke medium from without the State. Even were this impossible, a new contraband trade in cigarettes and papers would immediately spring up at exorbitant prices.*** The case is by no means on all fours with the traffic in habit-forming drugs, now the subject of another somewhat excessive "crusade." The difference is that whereas no normal person is addicted to the use of drugs, cigarette smoking within healthy limits is the harmless habit of millions of people all over the world, including probably two-thirds of the adult male population of Georgia.

As one prohibition after another is proposed with more or less excuse in theoretic benefit to individuals or the public, one wonders where the craze is to stop. There is hardly any form of pleasure which has not its crew of rampant censors and comminators—motoring, the dance, the theatre, flirtation, drugs, alcohol, kissing, eating meat, cigarettes, the use of tobacco in any form—all these and perhaps a dozen

others we do not call to mind are to-day the subject of agitations calling for prohibition by law on moral or hygienic grounds or both. Where is this to end? Are the people of America to be tied up presently in a tangle of worse than Chinese paternalism? Are individual mind and will and conscience to give way altogether to a paternalism, half ecclesiastic, half governmental, all fussy and fatuous and regardless of the plain lessons of experience? *

That expresses a radical opinion, but the source of the editorial commands attention to it. Let it be understood that I am not trying to belittle restrictive cigarette legislation as applied to minors, or at least to youths of eighteen or younger. Not at all.

For reasons that have been stated elsewhere in this volume—especially in the chapters on excesses of various kinds and on the cigarette in relation to the youth—I believe that such laws work for the welfare of humanity.

The whole opposition to the cigarette is based upon ignorance of it. Ignorance gave birth to superstition, and superstition begat blind prejudice. Before the Medico-Legal Society in New York, W. H. Garrison recently illustrated this by a brilliant parallel drawn in the course of a paper that he called "A Brief for the Cigarette":

*The Power
of
Popular
Prejudice*

"Picture, if you please, Congress solemnly listening to a petition to place a tax on tomatoes, legislatures and cities prohibiting their sale within their jurisdictions! The case of

*New York Medical Journal. Issue of July 25, 1914.

the tomato is nearly analagous to that of the cigarette."

Thus Mr. Garrison, and he goes on to tell how the tomato was introduced into Europe in the sixteenth century by Spaniards from South America, and was known in Italy as *Pomo dei Mori* (Moors' Apple). Similarity of sound made it in French *Pomme d'Amour* (Love Apple). And what happened? That name was enough to start the belief that there was something sinisterly dangerous about this innocent vegetable which two hundred years afterward came to be considered first a delicacy and then a necessity of every home.

It was not until 1793 that the stigma fell from the "Love Apple," and tomatoes first began to be eaten in Paris. Even at the present time this vegetable is avoided as poisonous by the peasants of several districts in Northern France.

In the early days of our own country tomatoes were raised only as curiosities and were known as "Love Apples," or "Wolf Peaches." I remember that, in my childhood in Illinois and Wisconsin there were many old people who would not touch tomatoes, or "Love Apples" as they called them, and that the conviction that they were dangerous became very firmly impressed upon my mind. In fact, it took years, after the prejudice was overcome in Paris, for the people of the United States to begin the use of the tomato as an article of diet, and it has been only within the memory of people now living that the *Pomme d'Amour* became generally accepted as staple.

The cigarette has not had so long an ordeal as that suffered by the tomato on account of the similarity in sound between the words "Moor" and "*Amour*," and as Mr. Garrison observes, the cigarette, at any rate, "has no phonetic enemy to contend against." Yet, in their essence, the histories of the tomato and the cigarette are much the same.

Already, however, the ignorant fight against the cigarette and the haphazard legislation regarding it are dying away. Week by week the prejudice is disappearing. Whoso has persevered to the end of this book will know why this is so and will, I believe, approve the new situation. For we have seen that the tobacco that goes into the making of the cigarette is the best and purest tobacco in the world, planted in the best soil, grown in the most healthful climates, cultivated with the tenderest attention. We have seen that it is harvested, cured, stemmed and sorted with almost incredible care. We have seen how, in the course of from three to five or six years of storage the leaves that go into cigarettes—bits of the leaves of selected grades and of several crops—are mellowed and sweetened by age. We have seen the markets of the Orient and of our Southland watched for their choicest products and millions upon millions of dollars invested for our tobacco solace. We have seen the raw material become the pure, clean and perfect finished product in machines that are miracles of ingenuity and factories that are marvels of cleanliness. We have seen that course of aseptic care carried through the

processes of inspection and boxing to the very case of the retailer whence the cigarette is sold, protected from the beginning of its manufacture until it reaches the consumer's lips.

We have seen this and we have seen more. We have seen slander after slander and myth after myth dissipated and dispelled. We know now that there is no drug of any sort added to the tobacco of the cigarette, that its nicotine is ineffective, and that there is no truth in the carbon monoxide and similar stories. We know that the cigarette is used by many athletes, by authors, clergymen, lawyers, scientists, engineers and physicians; that governments, wishing only for the best physical condition in their armies, supply their soldiers with cigarettes.

I have shown, I feel confident, that the proper use of the cigarette by mature persons is the best form in which tobacco may be used.

I hope I have made clear my belief that it is for the welfare of humanity that we should have state laws prohibiting the use of cigarettes by minors under eighteen. That is not because there is anything bad about tobacco or anything wrong about smoking. I should just as enthusiastically advocate legislation prohibiting children, during their years of bodily and mental development, from using a good many foods and beverages that parents unthinkingly permit them to eat and drink. I have stated this emphatically in my chapters on youth and the cigarette and on excesses.

What I am opposed to is the wholesale con-

demnation of the use of the cigarette by normal, mature people, and what I advocate is a standardization of cigarette legislation somewhat along the lines of the statutes recently passed by states that had learned the futility of making laws restricting the personal liberty of grown men—laws that could not be enforced because they did not have the impetus of public opinion behind them.

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